Vol. 912 Number 2

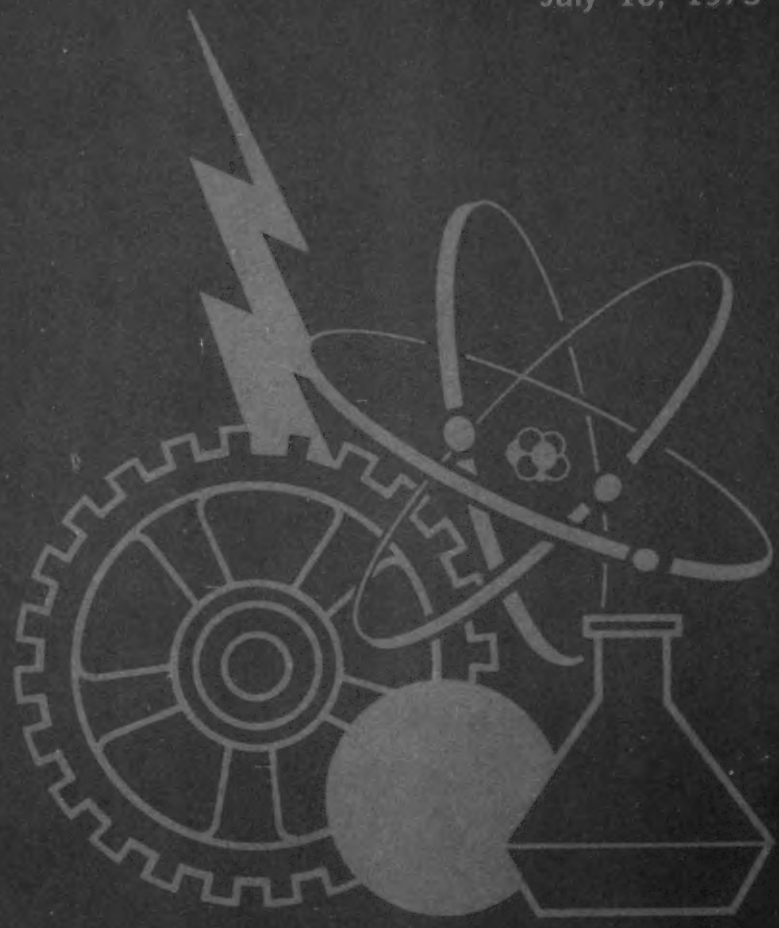
# OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

July 10, 1973



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 10, 1973 Volume 912 Number 2

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# PATENT OFFICE NOTICES

## Board of Appeals Decisions Rendered in the Month of May 1973

| | |
|---|---|
| Examiner affirmed | 141 |
| Examiner affirmed in part | 20 |
| Examiner reversed | 36 |
| Total | 197 |

## Patent Suits

### Notices under 35 U.S.C. 290; Patent Act of 1952

**2,958,842,** E. J. Schaefer, CABLE CONNECTOR, **filed** Jan. 8, 1973, D.C., N.D. Ind. (Fort Wayne), Doc. 73–F–6, *Franklin Electric Company Inc.* v. *Red Jacker Manufacturing Company.*

**3,498,304,** H. M. Rumbaugh, APPARATUS FOR CLEANING DISHWARE, **filed** July 30, 1970, D.C., N.D. Ohio (Cleveland), Doc. C–70–737, *The Tappan Co.* v. *Hugh M. Rumbaugh and Virginia W. Rumbaugh.* Decision: Order and final judgment finding defendant Hugh M. Rumbaugh is owner of patent; further order dismissing amended complaint and each of its counts filed by plaintiff Tappan Co. and counterclaim of defendants, Jan. 9, 1973.

**3,565,083,** S. J. Popeil, METHOD FOR SETTING HAIR, **filed** June 4, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1352, 71c295, 71c591, and 71c979, *Popeil Brothers Inc.* v. *Aldens Inc.* Decision: Plaintiff owner of patent. Defendants have neither infringed nor induced infringement of the patent in suit; therefore, the complaints are wanting in equity and are dismissed, Nov. 14, 1972.

**3,579,965,** J. J. Musgrove, MOWING MACHINE, **filed** Dec. 5, 1972, D.C.S.C. (Columbia), Doc. C/A 72–1521, *Johnnie J. Musgrove* v. *G. L. Shealey.*

**3,608,208,** F. W. Willardson, TEACHING MACHINE, **filed** Aug. 18, 1967, D.C., N.D. Ohio (Cleveland), Doc. C67–602, *Didactics Corp.* v. *The Welch Scientific Co.* Decision: Order dismissing action with prejudice, Sept. 1, 1972.

**3,609,679,** Updegraff and D'Ausilio, EARTH FIELD VEHICLE DETECTOR, **filed** Dec. 8, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2887–EC, *Threshold Engineering Inc.* v. *Signal Laboratories Inc. et al.* Decision: Dismissed on stipulation, Dec. 5, 1972.

**3,614,741,** McFarland and O'Loughlin, DATA PROCESSING SYSTEM, **filed** Oct. 2, 1972, D.C. Mass. (Boston), Doc. 72–3042–M, *Digital Equipment Corporation* v. *Lockheed Aircraft Corp. and Lockheed Electronics Company Inc.* **Same, filed** Oct. 25, 1972. D.C., C.D. Calif. (Los Angeles), Doc. 72–2535–JWC, *Lockheed Electronics Company Inc.* v. *Digital Equipment Corporation.*

**3,616,422,** Doremus and Davis, GALVANIC ANODE, **filed** July 28, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–1002, *Cathodic Protection Service* v. *American Smelting and Refining Company, Federated Metals Division and Wayne Broyles Engineering Company.*

**3,617,859,** Dobkin and Widlar, ELECTRICAL REGULATOR APPARATUS, **filed** July 13, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1596–F, *National Semiconductor Corp.* v. *Silicon General Inc.*

**3,627,973,** E. E. Smith, SUCCESSIVE AUTOMATIC DEPOSITION OF CONTIGUOUS WELD BEADS UPON NONPLANAR SURFACES, **filed** Nov. 3, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–2629–LTL, *D & W Rankin Manufacturing Co.* v. *Teledyne Inc.*

**3,651,881,** L. S. Dodgson, BUMPER GUARD FOR SNOWMOBILES, **filed** July 5, 1972, D.C., S.D. N. Dak. (Fargo), Doc. 4737, *Yamaha International Corp.* v. *Leonard S. Dodgson.*

**3,657,060,** T. I. Haigh, EMBROIDERED EMBLEM WITH THERMOPLASTIC ADHESIVE, **filed** Nov. 27, 1972, D.C.N.J. (Newark), Doc. 1895–72, *The Penn Novelty Company* v. *Joel and Aranoff Inc.*

**3,662,798,** J. W. Campbell, METHOD OF CUTTING PANELS, **filed** Nov. 6, 1972, D.C. Tex. (Fort Worth), Doc. 4–2144, *Wetoma Corp.* v. *Gary C. Heape and Ecotomic Group Inc., and Wellman Industries.*

**3,664,915,** W. L. Gore, SEALING MATERIAL, **filed** May 24, 1972, D.C. Del. (Wilmington), Doc. 4389, *Johnson & Johnson* v. *W. L. Gore & Associates Inc.*

**3,667,089,** Paton, Latash, Medovar, Zrailevich, Emelianenko, and Kljuev, APPARATUS FOR ELECTROSLAG REMELTING OF METALS WITH MOLTEN SLAG INTRODUCTION, **filed** June 13, 1973, D.C., S.D. Ind. (Indianapolis), Doc. IP 72–C–284, *Patent Management Inc.* v. *Calbot Corporation Stellite Division.* **Same, filed** July 10, 1972, D.C. (District of Columbia), Doc. 72–700–M, *Consarc Corporation* v. *Patent Management Inc., and Intritut Elektrosvarki Im. E. O. Patona.*

**3,675,247,** J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Oct. 13, 1972, D.C., W.D.N.C. (Charlotte), Doc. C–C–72–234, *Tights Incorporated* v. *Chadbourn Inc.* Decision: Defendant having taken a paid-up license under the patent which was the subject of this suit, this cause is hereby dismissed with prejudice, Dec. 20, 1972. **Same, filed** Dec. 19, 1972, D.C., N.D.N.C. (Greensboro), Doc. C–359–G–72, *Tights Inc.* v. *Burlington Industries Inc.*

**3,699,998,** F. Baranowski, Jr., CALIBRATED PRESSURE REGULATOR, **filed** Nov. 1, 1972, D.C. Mass. (Boston), Doc. ----------, *Frank Baranowski, Jr.* v. *Wingaersheek Turbine Co. Inc.*

**D. 223,389,** A. Schifrin, SPOT LIGHT, **filed** Jan. 17, 1972, D.C., N.D. Ill. (Chicago), Doc. 73c151, *Wallfrin La-Cal Industries Inc.* v. *Aris Products Co.*

**D. 225,843,** R. P. Buhk, CHAIR BODY, **filed** Jan. 16, 1973, D.C., E.D. Pa. (Philadelphia), Doc. CA–73–128, *Methastand Co. Inc. and Blair Manufacturing Company Inc.* v. *Steelcase Inc.*

## Certificates of Correction for the Week of July 10, 1973

| | | | |
|---|---|---|---|
| D. 226,150 | 3,694,176 | 3,708,814 | 3,715,030 |
| Re. 27,589 | 3,696,033 | 3,708,851 | 3,715,101 |
| 3,523,337 | 3,696,486 | 3,708,986 | 3,715,247 |
| 3,551,136 | 3,696,764 | 3,709,203 | 3,715,336 |
| 3,570,774 | 3,697,117 | 3,709,619 | 3,715,341 |
| 3,608,908 | 3,697,549 | 3,709,689 | 3,715,353 |
| 3,614,498 | 3,697,638 | 3,709,690 | 3,715,357 |
| 3,622,162 | 3,699,083 | 3,709,961 | 3,715,766 |
| 3,627,363 | 3,699,445 | 3,710,490 | 3,715,803 |
| 3,631,102 | 3,699,812 | 3,710,518 | 3,715,973 |
| 3,637,619 | 3,700,790 | 3,710,524 | 3,716,223 |
| 3,637,620 | 3,700,936 | 3,710,705 | 3,716,276 |
| 3,637,621 | 3,701,921 | 3,711,426 | 3,716,395 |
| 3,637,622 | 3,702,300 | 3,711,439 | 3,716,644 |
| 3,644,195 | 3,702,303 | 3,711,776 | 3,716,736 |
| 3,644,362 | 3,702,336 | 3,711,861 | 3,717,001 |
| 3,647,787 | 3,702,344 | 3,712,044 | 3,717,322 |
| 3,654,163 | 3,703,505 | 3,712,097 | 3,717,693 |
| 3,658,493 | 3,703,550 | 3,712,408 | 3,718,444 |
| 3,660,342 | 3,703,797 | 3,712,885 | 3,718,514 |
| 3,660,532 | 3,703,969 | 3,713,166 | 3,718,600 |
| 3,665,677 | 3,704,197 | 3,713,326 | 3,718,662 |
| 3,671,209 | 3,704,843 | 3,713,335 | 3,718,665 |
| 3,673,217 | 3,704,884 | 3,713,432 | 3,718,676 |
| 3,674,563 | 3,705,800 | 3,713,470 | 3,718,766 |
| 3,675,260 | 3,705,802 | 3,713,569 | 3,718,964 |
| 3,676,477 | 3,705,803 | 3,713,675 | 3,719,041 |
| 3,677,765 | 3,705,887 | 3,713,710 | 3,719,065 |
| 3,683,915 | 3,706,195 | 3,713,846 | 3,719,239 |
| 3,684,136 | 3,706,562 | 3,713,998 | 3,719,298 |
| 3,684,956 | 3,706,657 | 3,714,032 | 3,719,658 |
| 3,685,838 | 3,706,722 | 3,714,147 | 3,719,680 |
| 3,686,817 | 3,706,808 | 3,714,172 | 3,720,088 |
| 3,687,119 | 3,707,137 | 3,714,221 | 3,720,115 |
| 3,687,990 | 3,707,460 | 3,714,224 | 3,720,185 |
| 3,689,325 | 3,707,536 | 3,714,236 | 3,720,412 |
| 3,689,364 | 3,707,558 | 3,714,260 | 3,720,541 |
| 3,689,493 | 3,707,597 | 3,714,324 | 3,720,627 |
| 3,689,494 | 3,707,829 | 3,714,385 | 3,720,829 |
| 3,691,253 | 3,708,348 | 3,714,401 | 3,720,846 |
| 3,691,823 | 3,708,584 | 3,714,402 | 3,720,932 |
| 3,693,939 | 3,708,720 | 3,714,722 | 3,720,998 |
| | 3,708,752 | 3,714,872 | |

## Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,407,339, R. K. Booher, VOLTAGE PROTECTION DEVICE UTILIZING A FIELD EFFECT TRANSISTOR, decided Nov. 29, 1972, Interference No. 97,401, claims 1 and 3.

Patent No. 3,423,737, L. R. Harper, NONDESTRUCTIVE READ TRANSISTOR MEMORY CELL, decided Dec. 8, 1972, Interference No. 97,492, claims 5 and 6.

Patent No. 3,424,939, W. H. Clingman, VOLTAGE SWITCHING APPARATUS FOR COLOR KINESCOPES, decided Jan. 19, 1973, Interference No. 97,206, claims 39 and 40.

Patent No. 3,454,772, G. G. Vitt, Jr., and J. R. Gaskill, Jr., PHOTOELECTRIC MONITORING SYSTEM FOR HOLDING THE OBJECT PLANE IN PROPER FOCUS, decided Mar. 27, 1973, Interference No. 97,644, claims 1–9.

Patent No. 3,458,113, P. T. Swartzbaugh, PLASTIC CONTAINER, decided Mar. 29, 1973, Interference No. 97,804, claims 1, 3, and 5.

Patent No. 3,479,281, T. Kikindai and J. L. Burgaud, METHOD AND APPARATUS FOR THE SEPARATION OF PHASES BY GASEOUS FLOTATION, decided Mar. 5, 1973, Interference No. 97,808, claims 1–5.

Patent No. 3,483,219, L. H. Shepherd, Jr., COMPLEX COMPOUNDS OF HALOBERYLLIUM HYDRIDE WITH TERTIARY AMINES, decided Mar. 27, 1973, Interference No. 97,680, claims 1 and 2.

Patent No. 3,496,122, U. Niklaus and D. Porret, MODIFIED TRIGLYCIDYLISOCYANURATE RESINS, decided Mar. 7, 1973, Interference No. 97,490, claims 1, 7, 8 and 10.

Patent No. 3,594,461, F. J. Jacob, METHOD AND APPARATUS FOR CONTINUOUSLY MOLDING SHEETS FROM EXPANDABLE POLYMERIC MATERIALS, decided Mar. 12, 1973, Interference No. 98,106, claims 1 and 2.

## National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

*Notice of Availability for Licensing*

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA patent licensing regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the PAT-APPL number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at 50 cents each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
*Patent Program Coordinator, National Technical Information Service.*

U.S. ATOMIC ENERGY COMMISSION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent 3,677,825. Thermoelectric Generator. Filed Oct. 30, 1968. Patented July 18, 1972. Not available NTIS.

Patent 3,677,891. Antijam Sliding Seal Structure. Filed June 16, 1971. Patented July 18, 1972. Not available NTIS.

Patent 3,698,626. Centrifuge Separation. Filed May 17, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,699,044. Preperation of Ferro-Electric Ceramic Compositions. Filed Sept. 16, 1970. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,702,802. Nuclear Reactor Incorporating Means for Preventing Molten Fuel From Breaching the Containment Vessel Thereof in the Event of a Core Meltdown. Filed June 16, 1971. Patented Nov. 14, 1972. Not available NTIS.

Patent 3,703,460. Non-Equilibrium Plasma Reactor for Natural Gas Processing. Filed Sept. 30, 1970. Patented Nov. 21, 1972. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 318,247. Facile Synthesis of Human Insulin by Modification of Porcine Insulin. Filed Dec. 26, 1972. PC $3/MF $1.45.

Patent 3,692,493. Lymphocyte Transport Bag. Filed Sept. 22, 1970. Patented Sept. 19, 1972. Not available NTIS.

Patent 3,709,811. Specific Ion Electrode for Sulfate. Filed Sept. 21, 1970. Patented Jan. 9, 1973. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Streets NW., Washington, D.C. 20240

Patent 3,595,484. Reclamation of Refractory Carbides From Carbide Materials. Filed Feb. 28, 1969. Patented July 27, 1971. Not available NTIS.

[FR Doc. 73–12107; Filed 6–19–73; 8:45 am]

## Disclaimers

Des. No. 224,953.—*John C. Stephenson*, Los Angeles, Calif. SHAVING CADDY. Patent dated Oct. 24, 1972. Disclaimer filed Feb. 7, 1972, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Sept. 21, 1985.

3,438,944.—*Mary J. Stewart,* Riddlewood, *Media and John A. Price,* Swarthmore, Pa. ANTIMONY OXALATE AS A POLYCONDENSATION CATALYST. Patent dated Apr. 15, 1969. Disclaimer filed Oct. 4, 1972, by the assignee, *FMC Corporation.*

Hereby enters this disclaimer to claims 1 through 4 of said patent.

3,722,109.—*Nathaniel J. Jacobson,* Brookline, Mass. FINE AND GRAPHIC ARTS PRODUCTS FOR ENABLING AMATEURS AND OTHERS TO SELECT AND UTILIZE COLOR MATERIALS WITH OPTICAL RESULTS OF INCREASED PREDICTABILITY. Patent dated Mar. 27, 1973. Disclaimer filed May 31, 1973, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Dec. 21, 1988.

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**WILLIAM FELDMAN, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF JUNE 23, 1973

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-30-72 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 8-01-72 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 7-03-72 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 5-24-73 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 2-24-72 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales. | 11-15-72 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 10-16-72 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 10-02-73 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating. | 2-23-72 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 11-13-72 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 7-06-71 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 10-02-72 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks. | 7-03-72 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 10-12-72 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication. | 3-06-72 |
| MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines. | 8-24-72 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during July 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,752,595 to 2,757,377, inclusive
Plant Patents..... Numbers 1,492 to 1,504, inclusive

# DEFENSIVE PUBLICATIONS

## PUBLISHED JULY 10, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

### T912,001

### POWDER COATING PROCESS

Peter M. Grant, Hemlock Park, Kingsport, Tenn.

Filed Feb. 23, 1972, Ser. No. 228,763

Int. Cl. B05b *5/02;* B44d *1/094*
U.S. Cl. 117—17

No Drawing. 9 Pages Specification

Disclosed is a process for powder coating electrically nonconductive substrates which can withstand a temperature within the range of about 375° F. to about 500° F. without deforming, charring, and the like in selected areas. Suitable substrates are fabrics, paper products, glass, ceramics, thermosetting resins such as phenolics, ureaformaldehyde and ureamelamine resins, thermosetting polyesters and crystalline linear polyesters such as polyethylene terephthalate. In this process a grounded electrically conductive, shaped substrate is positioned adjacent one side of a nonconductive, heatable substrate. The opposite side of the nonconductive substrate is then contacted with charged polymer particles and the charged polymer particles adhere to the electrically nonconductive substrate only in a selected area having a shape corresponding to the shape of the grounded, electrically conductive substrate. The nonconductive substrate having the polymer particle deposited thereon is then heated to form the polymer particle into a coating fused to the nonconductive substrate in a shape corresponding to the shape of the grounded, electrically conductive substrate. The polymer particles can be comprised of cellulose ester, polyolefin, polyester or mixtures thereof. In one particularly advantageous embodiment the polymer can be composed of a mixture of poly (1,4-cyclohexylene dimethylene terephthalate/isophthalate) and cellulose acetate butyrate.

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### T912,002

### POLYETHYLENE-WAX EMULSIONS

William F. Baxter, Jr., Rte. 10, Windmere Place, Kingsport, Tenn. 37664, and Craig M. Davis, 2710 Schumway Drive, Johnson City, Tenn. 37601

Filed May 1, 1972, Ser. No. 248,918

Int. Cl. C08h *9/08*
U.S. Cl. 106—271

No Drawing. 10 Pages Specification

Method for producing low viscosity, high solids content emulsions comprising adding from about 0.01% to about 3% by weight, based on the total weight of the emulsion of sodium salt of polymerized sulfonic or carboxylic acid, preferably the sodium salt of sulfonated naphthalene formaldehyde condensate, to an emulsion of oxidized polyethylene, paraffin wax or a blend thereof in water. Suitable emulsifying agents or fatty acids and an alkaline reagent are also used in the emulsion. This emulsion may be used as components of various polishes and coatings.

### T912,003

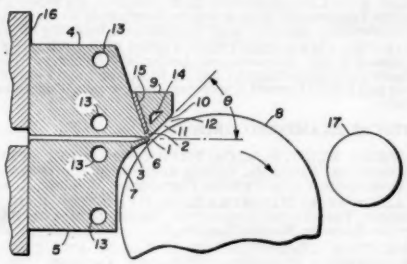
### EXTRUSION OF RESINS

Keith Marchant, Newport, and Durgacharan Sen, Cwmbran, Wales, assignors to Monsanto Chemicals Limited, London, England

Filed May 23, 1972, Ser. No. 256,060

Int. Cl. B29d *27/00*
U.S. Cl. 264—51

1 Sheet Drawing. 25 Pages Specification




A sheet of foamed thermoplastic synthetic resin is made by extruding a foamable thermoplastic synthetic resin through a slit die. The die comprises an exit zone defined by a pair of opposing surfaces. One of the surfaces moves in the direction of the extrusion and is convex in that direction. The other surface is planar. Foaming of the resin occurs as it moves through the exit zone. The relative spacing of the surfaces is such that they contact the expanding and foaming resin and a foamed resin sheet is produced.

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### T912,004

### METHOD FOR CALCULATING SURVIVAL COEFFICIENTS

Willard G. Bouricius, Katonah, and Betty J. Schultz, New Rochelle, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1972, Ser. No. 267,826

Int. Cl. G06f *7/00, 9/00;* G06h *15/34*
U.S. Cl. 444—1

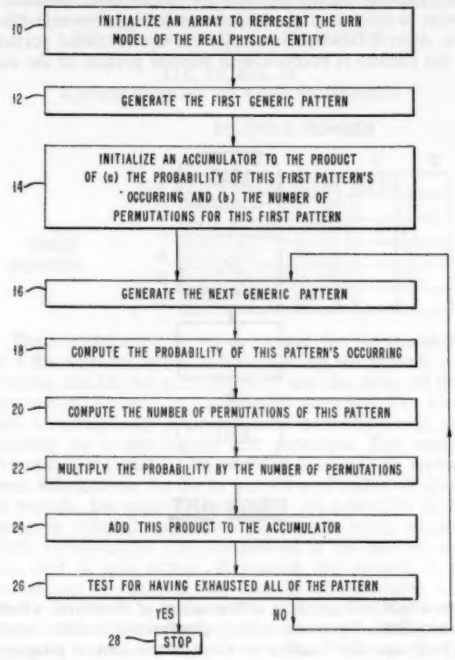
2 Sheets Drawing. 32 Pages Specification

A method of determining the values of the term $H_f$ in the reliability equation for a storage organization:

$$R_{store}=\sum_{f=0}^{\infty} P_f H_f$$

wherein $P_f$ is the probability of there being $f$ failures in the organization and wherein the values of $H_f$ are the

survival coefficients, the storage organization comprising a quantity of $l$ words of $n$-bit length, and being constructed so as to correct a quantity of $c$ errors. The method comprises:


10
INITIALIZE AN ARRAY TO REPRESENT THE URN MODEL OF THE REAL PHYSICAL ENTITY
12
GENERATE THE FIRST GENERIC PATTERN
14
INITIALIZE AN ACCUMULATOR TO THE PRODUCT OF (a) THE PROBABILITY OF THIS FIRST PATTERN'S OCCURRING AND (b) THE NUMBER OF PERMUTATIONS FOR THIS FIRST PATTERN
16
GENERATE THE NEXT GENERIC PATTERN
18
COMPUTE THE PROBABILITY OF THIS PATTERN'S OCCURRING
20
COMPUTE THE NUMBER OF PERMUTATIONS OF THIS PATTERN
22
MULTIPLY THE PROBABILITY BY THE NUMBER OF PERMUTATIONS
24
ADD THIS PRODUCT TO THE ACCUMULATOR
26
TEST FOR HAVING EXHAUSTED ALL OF THE PATTERN
YES
NO
28
STOP

(a) Generating survival patterns for given values of $c$, $f$, $n$ and $l$ wherein there are considered all of the arrays

$$\begin{matrix} S_{11}\ S_{12}\ \ldots\ S_{1l} \\ SS_{21}\ S_{22}\ \ldots\ S_{2l} \\ \vdots \\ S_{n1}\ S_{n2}\ \ldots\ S_{nl} \end{matrix}$$

wherein $S_{ij}$ is the number of failures in the $i$th bit of the $j$th word with

$$R_i=\sum_{k=1}^{l} S_{ik}$$

such that

(1) $$R_i \sum_{i=1}^{n} R_i=f$$

(2) $$R_1 \geq R_{i+1} \text{ for } i=1, \ldots, (n-1)$$

(3) $$S_{ik} \geq S_{ik+1} \text{ for } k=l, \ldots, (l-1)$$

and wherein the term $A_m$ is defined as the number of $R_i=m$ for $m=0, \ldots, f$, the term $B_{im}$ is defined as being equal to the number of $S_{ik}=m$ for $m=1, \ldots, f$, the term $D_i$ is defined as

$$\sum_{m=1}^{f}$$

and wherein

$$\sum_{m=0}^{f} A_m=n$$

the primitives being modified by shifting each row thereof sufficiently to the right to fit a given set of replication numbers ($X_{ij}$) wherein $X_{ij}$ is equal to the number of non-zero positions introduced for the $j$th time in the $i$th row whereby, for any given primitive, the range of replication numbers, all of which produce survival patterns, are determined as follows:

$$G_{ij}=\sum_{k=1}^{i} X_{kj}$$

wherein $X_{11}=D_1$ and wherein for $i>1$

$$\sum_{j=1}^{c} X_{ij}=D_i$$

such that

(4) $$0 \leq X_{ij} \leq G_{i-1,\ j-1}-G_{i-1,\ j}$$

wherein $j=l, \ldots, i$ and

(5) $$X_{ij}=0 \text{ wherever } j>i \text{ or } j>c$$

(b) Calculating the number of permutations of each survival pattern in accordance with the equation:

$$H(c, f, n, l)=\frac{l_{G_{n1}} n_n-A_0}{\prod_{m=1}^{f}\left(A_m! \prod_{i=1}^{n} B_{im}!\right)} \times \prod_{i=1}^{n} \frac{\left(\sum_{j=1}^{c} X_{ij}\right)!}{\prod_{j=1}^{c} (X_{ij})!} \times \prod_{i=1}^{n-1} \prod_{j=1}^{c-1} (G_{ij}-G_{i,\ j+1}) x_{i+1,\ j+1}$$

(c) Calculating the probability of the occurrence of each pattern in accordance with the following expression

$$\frac{f!}{(nl)^f \Pi (S_{ik})!}$$
$$i=1, \ldots, n$$
$$k=1, \ldots, l$$

and multiplying that probability by the number of permutations; and

(d) Summing all of the products resulting from step (c) over all of the generic survival patterns.

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**T912,005**

## METHOD FOR THE COMPUTER GENERATION OF DEVELOPMENTS

**Arthur Appel, Yorktown Heights, and Arthur J. Stein, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

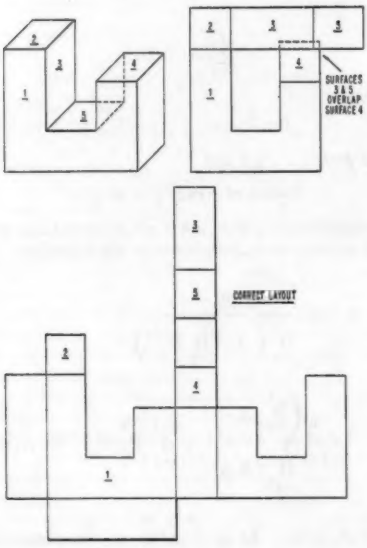
**Filed June 30, 1972, Ser. No. 267,843**

**Int. Cl. G06f *15/20***
**U.S. Cl. 444—1**

**18 Sheets Drawing. 37 Pages Specification**

The method for computer developing a three-dimensional object wherein the development state of each plane surface on the object is defined as IDV(N) wherein N is the surface label. There is first read into the computer's

memory a vertex list and a topological map which describes the object and then the equations of the planar surfaces on the object are calculated, the equation taking the form $Ax+By+Cz+D=0$, the coefficients A, B, and C also being the direction cosines of a line perpendicular to the surface. There is next calculated the orthographic projection of each surface in the direction of the surface normal. Thereafter, all surfaces adjacent to a first surface being processed are found. The term IDV(1) is taken to equal 1 and the term IDV(N) for all surfaces adjacent to surface 1 is set to 0. At this juncture, a list of surfaces is gone through to find the surface which has a development state IDV($N$)=0, the true shape of which is derived from the orthographic projection. The projection is shifted and rotated so that the true shape projection lies tangent to the true shape projection of surface having the IDV($N$)=1. There are then found all surfaces adjacent to the last-named found surface and if IDV($N$)=−1 for these surfaces, their IDV(N) states are set to 0. The list of surfaces is continued through until a surface is encountered having an IDV($N$)=0, thus indicating that it must be adjacent to a previously developed surface. Such encountered surface is aligned with a previously developed surface and in this position the surface's development is tested to insure that it does not overlap or interfere with a previously developed surface. The method is iteratively passed through until all surfaces reach an IDV($N$)=1 state to enable the drawing of the development of the three dimensional object.

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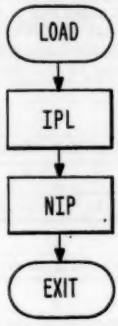
**T912,006**

**MULTIPHASE NUCLEUS LOADING FOR A VIRTUAL SAORAGE SYSTEM**

**Timothy L. Brannon, Endwell, and Henry T. Mehl, and Michael R. Zick, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed July 31, 1972, Ser. No. 276,621**
**Int. Cl. G06f** *7/00, 9/00, 15/45*
**U.S. Cl. 444—1**
**7 Sheets Drawing. 20 Pages Specification**

A multiphase control program nucleus loading method reduces the amount of real storage required for initialization by dividing the initialization process into phases. Each phase operatng in sequence controls the loading of a different portion of the control program nucleus into real or virtual storage. Only those portions of the control program nucleus required for performing the initialization process at a given time are loaded into real storage. After a function is completed, the obsoleted portion of the nucleus is overlaid with another portion of the nucleus which will perform a next series of functions which are required. By using a time dimensional scatter loading technique for loading portions of the control program nucleus only when they are required for their function, the amount of real storage required for nucleus initialization is significantly reduced; and pageable portions of the control program nucleus not required for initialization are loaded directly into virtual storage.




**PRIOR ART**

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**T912,007**

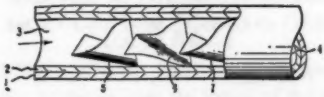
**FLOW DIVIDERS IN MEMBRANE PERMEATION SEPARATION APPARATUS**

**Naftali Walter Rosenblatt, Wilmington, Del., assignor to E. I. du Pont de Nemmours and Company, Wilmington, Del.**

**Continuation-in-part of abandoned application Ser. No. 89,225, Nov. 13, 1970. This application Oct. 3, 1972, Ser. No. 294,586**

**Int. Cl. B01d** *13/00*
**U.S. Cl. 210—23**

**1 Sheet Drawing. 22 Pages Specification**



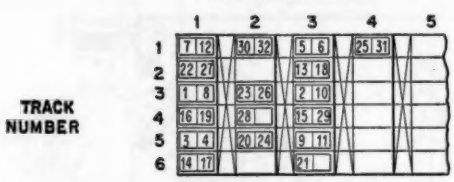
Concentration polarization and the resulting decreased efficiency of selective permeation separation processes using membranes is reduced by devices located near the membranes which repetitively divide the flowing feed mixture stream into substreams, displace these sub-streams with respect to each other and the membrane, and contact at least one displaced substream with the membrane.

**T912,008**

# METHOD FOR REORDERING THE RECORDS OF A FILE

**Brian T. Bennett, Mohegan Lake, and Archie C. McKellar, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 26, 1972, Ser. No. 318,335**
**Int. Cl. G06f 7/24**
**U.S. Cl. 444—1**
**6 Sheets Drawing. 40 Pages Specification**




There is described herein a method for the reordering of a file whereby, after such reordering, the records constituting the file are arranged such that the order of their key values is biased in a sequential direction. The file is thus advantageously preconditioned for being sorted, particularly by a distribution sort technique. The method first entails the performing of an internal sort by replacement selection on the file to provide a plurality of strings of records, the records constituting the respective strings being in ordered sequences, the strings being consecutively numbered as they are created in the internal sort, viz., first to *m*th strings. If desired, the records in the strings can be blocked, i.e., each block containing 1, 2, . . . , *k* records as desired. The records are then written onto a "direct access" storage device such as a disk or a drum in a manner whereby the first block of the first string is placed on the first sector of the first track of the storage, the second block of the first string is placed on the second sector of the first track, etc., the first block of the second string is placed on the second sector of the second track, the first block of the third string is placed on the third sector of the third track, et seq. Thus, if $B_{ij}$ represents the *j*th block of the *i*th string, then the blocks are written onto the storage device as follows:

| | Sectors | | | |
|---|---|---|---|---|
| Tracks | 1 | 2 | 3 | *n* |
| 1 | $B_{11}$ | $B_{12}$ | $B_{13}$ . . . | $B_{1n}$ . . . |
| 2 | | $B_{21}$ | $B_{22}$ . . . | $B_{2,\,n-1}$ . . |
| 3 | | | $B_{31}$ . . . | $B_{3,\,n-2}$ . . . |
| . | | | | . |
| . | | | | . |
| . | | | | . |
| *m* | | | $B_{m1}$ . . . | $B_{m,\,n-m+1}$ . . . |

With the records so arranged on the direct access storage device, they are read diagonally therefrom, i.e., the first block of the first string followed by the first block of the second string et seq., then the second block of the first string followed by the second block of the second string, et seq., to produce a file having the order

$$B_{11}, B_{21}, \ldots, B_{m1}, B_{12}, B_{22}, \ldots$$

$$B_{m2}, \ldots, B_{m3}, \ldots, B_{mn}$$

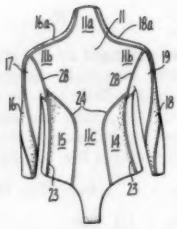
With the placing of the blocks on the "direct access" storage device in this manner, the arrangement is effected whereby the beginning of the next block to be read/written is rotationally adjacent to the end of the last block which was read/written whereby latency and seek time are significantly minimized. The reordering of the file produced from the reading out of the blocks in the diagonal manner as described hereinabove can now be advantageously utilized in a distribution sort, such as of the tag or record types.

# PATENTS

## GRANTED JULY 10, 1973

## GENERAL AND MECHANICAL

**3,744,052**
**JACKET CONSTRUCTION FOR UNDERWATER DIVING GARMENT AND MAKING THE SAME**
**Carl T. Rector, 2408 Meadow Lane, Eureka, Calif.**
**Continuation of Ser. No. 874,308, Nov. 5, 1969, abandoned. This application Sept. 9, 1971, Ser. No. 179,213**
**Int. Cl. A62b *17/00***
**U.S. Cl. 2—2.1 R** **8 Claims**




An underwater jacket that may be made in several different sizes using the same or substantially identical panel sections and other panel sections of varying dimension to control jacket size, comprising back, chest and a pair of kidney panels, said back and chest panels being identical or substantially the same for all sizes of garment, said kidney panels being cut to varying widths depending on the size of jacket desired.

An underwater jacket that may be made in several different sizes using the same or substantially identical panel sections and certain other panel sections of selected and varying dimension to control garment size, comprising back, chest and kidney panels; and a pair of sleeves, each sleeve made from a pair of panel sections, both panel sections extending the full length of the sleeve and joined together by a pair of spaced seams, the width of one panel section being selected to fix the arm size of the jacket, said one panel section including an integral shoulder strip extending to the neckline of said garment and joined by seams to said chest and back panels, the other panel section of each sleeve being joined to said back and chest panels with seams extending around the armpit of the jacket.

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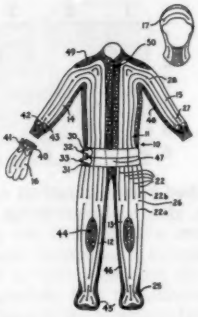
**3,744,053**
**LIQUID LOOP GARMENTS**
**Eugene K. Parker; Kenneth E. Mayo, both of Nashua, and Douglas G. Harvey, Amherst, all of N.H., assignors to Sanders Nuclear Corporation, Nashua, N.H.**
**Filed Feb. 11, 1970, Ser. No. 10,472**
**Int. Cl. B63c *11/02***
**U.S. Cl. 2—2.1 R** **9 Claims**

Liquid loop garments provide thermal protection to the body of a user in hostile temperature environments. First and second superimposed liquid impervious, yieldable sheets are secured together at selected portions to form liquid barriers at preselected positions between the first and second sheets. The barriers and sheets define adjacent liquid channels which act to direct flow of a heat transfer medium passed into the garment. Inlet and outlet manifolds are each connected with a plurality of the channels so that heat transfer liquid can be passed into an inlet valve and distributed over the body of an individual with efficient control of temperature variations in the garment. The garment is particularly useful as an underwater diver's heating suit to protect divers from extreme cold environments normally encountered at depths.

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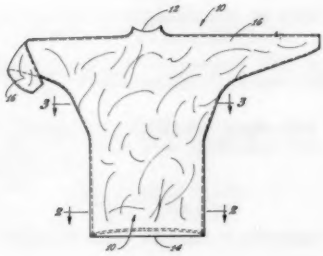
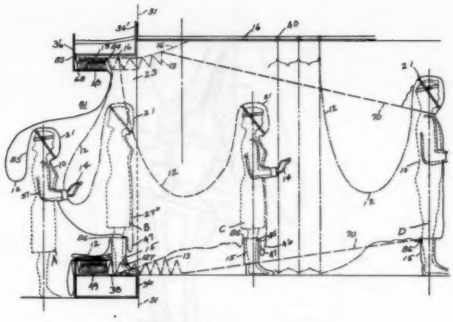
**3,744,054**
**AQUATIC PROTECTIVE GARMENT**
**Robert B. Schultz, 26511 Dunwood Road, Rolling Hills Estates, Palos Verdes, Calif.**
**Continuation-in-part of Ser. No. 111,301, Feb. 1, 1971, abandoned. This application June 5, 1972, Ser. No. 259,750**
**Int. Cl. B63c *11/04***
**U.S. Cl. 2—2.1 R** **3 Claims**




An improved seamless aquatic shirt of the "dry suit" type is provided for surfing, skin diving, water skiing, and the like. The shirt is composed of a latex material of a thickness which is tapered so as to have a maximum thickness at the waist which gradually decreases to a minimum thickness at the neck and sleeves. The tapered garment of the invention is easier to put on and take off as compared with the shirts of corresponding prior art dry suits, and it has other features as will be described. In a second embodiment of the invention, for example, mittens are formed integral with the sleeves as a molded extension of the shirt, so that the wearer's hands, like the rest of his body, will remain dry and warm.

**3,744,055**
**ENVIRONMENTAL SUIT**
**Thomas Brendgord, Fairview, Pa., assignor to American Sterilizer Company, Erie, Pa.**
**Filed Sept. 19, 1969, Ser. No. 862,152**
**Int. Cl. A41d *13/00***
**U.S. Cl. 2—2** **10 Claims**



This specification discloses an environmental suit fabricated from flexible material. The suit has a hoop supported entrance. The hoop is sealed to the entrance module and an entrance tunnel provides access to the suit. The entrance module folds accordian style for storage, and a unique loose, unsupported umbilical section is attached to the suit. The entire suit, umbilical section and tunnel may be stored in the entrance module. Semi-rigid boots are provided for easy ingress and egress. Removable cuffs on the suit make it easy to change gloves from heavy work gloves to the surgical rubber gloves for finger sensitivity. A built-in life support system supplies filtered air to helmet and gloves. The air lines provided are flat and sandwiched between two layers of material. The entrance tunnel is supported by an overhead track which makes it easy to move the suit about.

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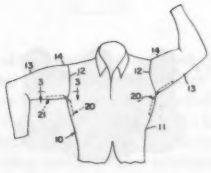
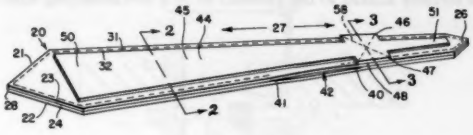
**3,744,056**
**GARMENT HAVING ARMPIT PROTECTION MEANS**
**Alexander Bond, 4825 N. Broad St., Philadelphia, Pa.**
**Continuation-in-part of Ser. No. 123,551, March 12, 1971, abandoned. This application May 18, 1972, Ser. No. 254,714**
**Int. Cl. A41d *27/12***
**U.S. Cl. 2—54** **3 Claims**



A shirt or blouse type garment having an internal torso pocket along one side of the torso part opening toward the armhole, and an internal sleeve pocket along a lower sleeve region opening toward the armhole, together with an elongate absorbent pad extending through the armhole and having its opposite end regions removably retained in inserted relation within respective pockets.

**3,744,057**
**REVERSIBLE NECKTIE AND METHOD FOR MAKING SAME**
**Joseph A. Luceri, 8 Suncrest Road, Andover, Mass.**
**Filed Apr. 2, 1971, Ser. No. 130,636**
**Int. Cl. A43d *25/06***
**U.S. Cl. 2—146** **16 Claims**



A reversible necktie has two individual face fabrics united along the edges and then inverted to inturn the edge seams. The tie has flat, non-bulky edges pressed flat without creating a visible seam, or filler line. The filler is united to the face fabrics only at the neckband. The filler edges abut without entering between the edge seams so that its ends are free and unconnected. The free opposite ends of the filler are withdrawn from the tie, an expansible backer tool inserted, the edges pressed flat against the tool, the tool withdrawn and the filler reinserted.

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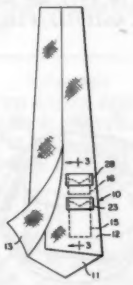
**3,744,058**
**NECKTIE WITH CONCEALED POCKET**
**Alexander Bond, 4825 N. Broad St., Philadelphia, Pa.**
**Filed Mar. 22, 1972, Ser. No. 237,095**
**Int. Cl. A41d *25/00***
**U.S. Cl. 2—157** **2 Claims**



A four-in-hand necktie wherein a back wall of the necktie includes a pocket concealed from view but readily accessible for insertion and removal of articles therefrom.

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**3,744,059**
**TENNIS BALL POCKET**
**Saul Hayes, 16 Victoria Drive, New York, N.Y.**
**Filed Jan. 7, 1972, Ser. No. 216,115**
**Int. Cl. A41d *27/20***
**U.S. Cl. 2—250** **5 Claims**

A pocket for a tennis ball which is attachable to a garment and which will retain the ball without interfering with the activity of the participant during play. The pocket includes a base element for attachment to the garment and which has affixed thereto and across, an extensible elastic fabric material of sufficient elasticity to receive and hold the ball, permit ready removal thereof and which will lie flat and unobstrusive when empty. The elastic material is capable of bilateral extension and conforms in shape to the outer edge of the base element which is generally provided with a pair of straight paral-

lel edges joined at one end by a semicircular segment to form a "U." The outer edge of the base element and elastic material are joined together along this edge as by stitching, adhesive or any other suitable means. This aforedescribed structure is open at one end and there is provided a closure means across the elastic material to insure proper closing thereacross. This latter means can take the form of an elastic piping or a multiple foldover of the elastic material. The pocket, thus formed, is suitably affixed to the garment as by a thermosetting adhe-

sive on the base element surface opposite the pocket, or physically attached by stitch sewing, by buttons or where applicable, by a zipper. Additionally, a dual pocket can be formed by merely forming the backing and the elastic material each in a unitary shape resembling a pair of "U" s joined at the center arm and stitched thereacross. Reduced to a basic configuration, it is merely necessary to affix the elastic fabric material directly to the garment such as tennis shorts, and thus delete entirely the backing material element.

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**3,744,060**

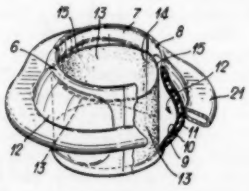
**PROSTHETIC CARDIAC VALVE**

**Brian John Bellhouse, The Ridings, Islip, and Francis Hewitt Bellhouse, 34 Hill Rise, Old Woodstock, both of England**

**Filed June 10, 1971, Ser. No. 151,741**

**Int. Cl. A61f *1/22*; F16k *15/14***

**U.S. Cl. 3—1** **10 Claims**



A prosthetic atrio-ventricular or pulmonary valve for permanent cardiac implantation comprising a tubular valve body formed with two or more angularly spaced outwardly projecting sinus like bulges in its wall, and not appreciably extending axially in either direction beyond the bulges so that the external shape of the valve body is pseudo barrel shaped. The valve body contains a number of thin flexible impermeable cusps one registering with the internal hollow provided by each bulge. Each cusp is sealed to the valve body along its upstream and axially extending edges but has a free downstream edge which terminates in the axial direction short of the downstream edge of the corresponding hollow and which has a length such that when the valve is open the cusps can surround a substantially cylindrical passageway through the valve but when the valve is closed the free downstream edges of the cusps can meet and seal against those of the adjacent cusps along radial planes. The arrangement is such that the downstream edge of the hollows provided by the bulges intercepts part of the flow through the valve so that vortices are set up in the hollows tending to close the cusps.

**3,744,061**

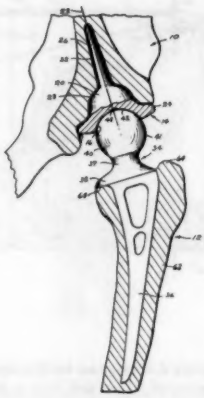
**ARTIFICIAL HIP JOINT AND METHOD OF IMPLANTING IN A PATIENT**

**Harold M. Frost, 992 Dowling, Bloomfield Hills, Mich.**

**Filed Sept. 13, 1971, Ser. No. 179,912**

**Int. Cl. A61f *1/24***

**U.S. Cl. 3—1** **20 Claims**



An artificial hip joint having a cup-shaped acetabular component and a femoral component carrying a ball in which the acetabular component when inserted into the acetabulum of a patient shifts about a controlled axis of rotation. The ball of the femoral component fits within the socket of the acetabular component and makes rolling contact with the socket wall spaced from the axis of rotation of the acetabular component during walking movement of the femur.

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**3,744,062**

**HEART VALVE CONSTRUCTION HAVING A COLLAGEN COVER ENCAPSULATION THEREON**

**Victor Parsonnet, 113 Sagamore Road, Millburn, N.J.**

**Filed Oct. 8, 1971, Ser. No. 187,788**

**Int. Cl. A61f *1/22***

**U.S. Cl. 3—1** **3 Claims**

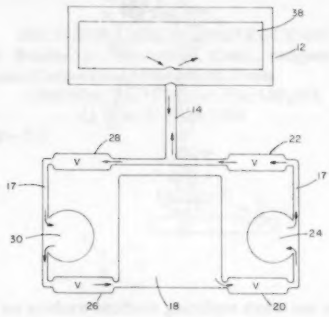
An autogenous heart valve with three leaflets is formed by a mold having slick back-up segments positioned behind each leaflet while the heart valve is implanted in the human body until a collagen covering has been formed; the heart valve so formed is removed from the host body, the excess collagen and mold are removed and the valve is implanted in the correct valve position in the heart.

3,744,063

## ARTIFICAL SPHINCTER FOR CONTROLLING URINARY INCONTINENCE

Daniel M. McWhorter, Arlington Heights, and Glenn N. Taylor, Cary, both of Ill., assignors to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 888,368, Dec. 29, 1969, abandoned.
This application Oct. 12, 1971, Ser. No. 188,585
Int. Cl. A61f 1/00; A61b 17/00
U.S. Cl. 3—1 9 Claims



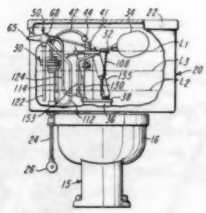

An artificial sphincter for the control of urinary incontinence is provided by wrapping around the urethral canal an inflatable plastic collar connected to a system of small pumps and valves governing the flow of fluid into and out of a fluid reservoir. The valves and pumps are so arranged that inflation and deflation of the collar is carried out in incremental steps, so that the applied pressure or release of pressure is graduated and controlled.

3,744,064

## TOILET OPERATING AND CONTROL SYSTEM

Charles L. Preston, Cincinnati, Ohio, assignor to Edwin P. Hofstadler, Hamilton, Ohio

Filed May 2, 1972, Ser. No. 249,525
Int. Cl. E03d 1/22, 1/30
U.S. Cl. 4—34 17 Claims



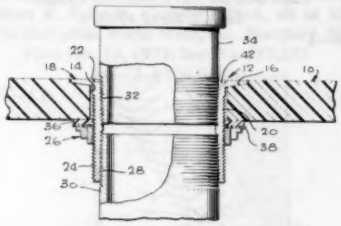
Water is supplied to a water storage tank through a float-actuated fill valve and a primary control valve of a flush control unit which provides for selecting either a full flush or a partial flush of the water in the tank into the toilet bowl. The primary control valve determines whether water flows directly into the tank or to a secondary control valve connected by a tube to a water-actuated cylinder which is effective to close the flush valve member after a partial flush. The secondary control valve is actuated by movement of the float support rod connected to the fill valve and cooperates with the primary control valve to assure proper filling of the bowl after either a full flush or partial flush. The control unit also provides for reversing between a full flush and a partial flush at any time, and for providing anti-siphon protection in the fill line, in addition to accommodating a wide pressure variation in the fill line.

3,744,065

## FITTING FOR PREFORMED SHOWER PANS

Morris Yavitch, 1008 Benedict Canyon Drive, Beverly Hills, Calif.

Filed June 1, 1971, Ser. No. 148,635
Int. Cl. A47k 3/22
U.S. Cl. 4—146 4 Claims



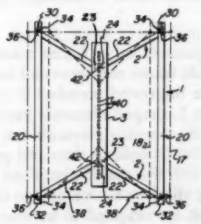

A fitting for use with preformed shower pans, which facilitates installation of the drain pipe in the fitting and removal of the drain pipe if repairs are needed at a time after installation. The fitting has a tubular portion closely received and passing through a drain hole in the shower pan, and has a flange at the top for resting on the upper surface of the shower pan. Two tapered inside threads are formed on the fitting, one extending into the lower end and the other into the upper end, for receiving a drain pipe and test standup, respectively. A thread is formed on the outside of the lower fitting portion for receiving a nut that holds the fitting securely to the shower pan. If the drain pipe must be removed, this can be accomplished without damaging the outside threads by one workman stationed below the shower pan, who can grasp the nut with one wrench and the drain pipe with another wrench and turn them in opposite directions, any turning of the nut merely further tightening it so that the drain pipe will soon begin turning to become loosened.

3,744,066

## SELECTED WIDTH BED FRAME

Vincent Falivene, 905 85th St., North Bergen, N.J.

Filed Aug. 18, 1971, Ser. No. 172,759
Int. Cl. A47c 19/00; A47f 1/00
U.S. Cl. 5—176 R 9 Claims



A bed frame in which a pair of parallel side members are joined together by a pair of end members, each end member being divided into two sections affixed to one another by first pivots. The end members are connected to the side members by second pivots such that movement of the first pivots toward and away from one another moves the side members toward and away from one another. A lock plate extends between the end members and is affixed thereto to lock the first pivots against movement when the side members are at a selected distance apart corresponding to the desired width of the bed frame. A clamp is affixed to one end of each side member by a

stem which passes through overlying slots in the side member and includes a pair of clamping means for securing a headboard to the bed frame.

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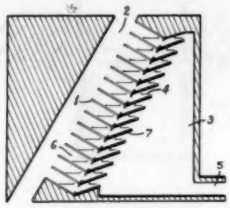
**3,744,067**
**SUPER SUPER**
**Richard Paul Bentley, Box 786, Tupper Lake, N.Y.**
**Filed Oct. 28, 1971, Ser. No. 193,307**
**Int. Cl. A01k *47/00***
**U.S. Cl. 6—1** **3 Claims**



The Super Super herein disclosed is used in place of a honey super on a beehive. The invention contains an access space permitting the entry of honey bees to the face of a honeycomb section with cells open at both ends. Honey deposited in the cells by the bees flows through the honeycomb section into a honey chamber and out an outlet for collection.

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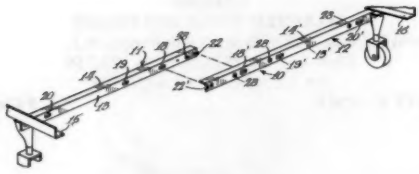
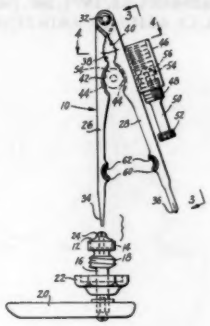
**3,744,068**
**ADJUSTABLE BED FRAME MEMBER**
**Allan E. Harris, Chicago, Ill., assignor to Harris-Hub Company, Inc., Harvey, Ill.**
**Filed Mar. 7, 1972, Ser. No. 232,475**
**Int. Cl. A47c *19/00***
**U.S. Cl. 5—181** **10 Claims**



An improved adjustable cross frame member for use in a bed frame having side frame members and another such cross frame member. The improved member is comprised of first and second elongate L-shaped elements having mutually perpendicular legs. Both elongate elements are provided with a plurality of longitudinally spaced slots and protruding fingers in one leg thereof, with the spacing between slots and fingers and their sizes being alike for both elongate elements. The fingers of each element are oriented to be inserted into respective slots of the opposite element which are complementary therewith when the elements are initially positioned with like legs in face abutting engagement. The elongate elements are then longitudinally moved relative to each other to position each inserted finger in overlapping engagement with the portion of the opposite element adjacent the slot in which the fingers are initially inserted, and thereby positively hold the elements against separation. In order to lock the elements longitudinally in this position, one of the elements includes position defining apertures associated with each of the slots, and the other element includes a releasable resilient member having a detent which engages a position defining aperture when the fingers are moved in overlapping engagement with the elements.

**3,744,069**
**WASHER SHAPING TOOL**
**Wolfe Grebow, 8402 Carlson Lane, Baltimore, Md.**
**Filed June 23, 1971, Ser. No. 155,932**
**Int. Cl. B25b *7/22***
**U.S. Cl. 7—4** **5 Claims**



A tool for use when replacing resilient washers on faucets, spigots and the like including a pair of pivotally interconnected members having a screw driver on the free ends thereof for removing and replacing the washer retaining screw and opposed cutting surfaces on the inner surfaces of the members for abrading material from the periphery of the washer when placed therebetween, manually clamped and rotated in relation thereto. A holder is provided for supporting the washer when it is being rotated during the abrading operation.

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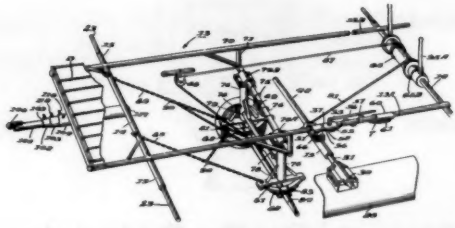
**3,744,070**
**TRANSPORTING AND LAUNCHING ARRANGEMENTS FOR AMPHIBIOUS CAMPERS**
**Robert H. Shaw, 131 Oakwood Lane, Ithaca, N.Y.**
**Filed Apr. 29, 1971, Ser. No. 138,613**
**Int. Cl. B63c *13/00***
**U.S. Cl. 9—1 T** **7 Claims**



A pontoon raft, boat or the like with land supporting wheels which is arranged for road travel when towed by a camper loaded vehicle and also which is provided with laterally wide spread water supporting pontoons. The wheels are journalled on a retractable carriage and are raised and lowered by manually controlled means arranged to provide torque in torsion spring means mounted to assist in movement of the retractable carriage. The pontoons, which are alternately raised and lowered to inboard and outboard positions, are likewise by manually controlled means arranged to arm and relax torsion spring means operatively associated with each pontoon for assisting in raising or lowering the pontoons for alternate land to water or water to land travel.

Also, in combination with the transfer from land to water and vice versa, there is provided a telescopic draft means, extensible for launching and retractible for de-launching, as the pontoon raft is transferred from land to water and vice versa.

Such use of the pontoon raft may be as a houseboat by transfer of a vehicle carried camper body to the raft deck. The transfer of a truck camper from a truck to a raft deck is the foundation of this invention and the various techniques and mechanisms are supplemental to that essential goal, including launch and recovery.

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**3,744,071**

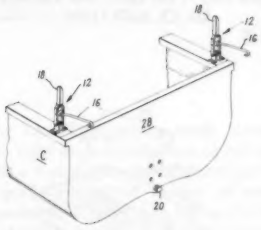
**SECTIONAL BOAT CONSTRUCTION**

**Robert B. Bossler, Jr., Bloomfield, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.**

**Filed Mar. 24, 1971, Ser. No. 127,671**

**Int. Cl. B63b 7/04**

**U.S. Cl. 9—2 S** **6 Claims**



Three basic boat sections or units are described herein, which boat sections can be joined to one another in a variety of configurations as each boat section has at least one end with a generally flat bulkhead adapted to mate with a flat bulkhead on any of the other boat sections. Each bulkhead associated end of each boat section further includes portions of latching means adapted to releasably secure these boat sections to one another. At least one of the three boat sections has a pointed end to define the bow of either a short two or three section boat, or alternatively to define opposite ends of a canoe or three section boat. Various other boat configurations utilizing four or more of said typical three boat sections can also be assembled readily.

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**3,744,072**

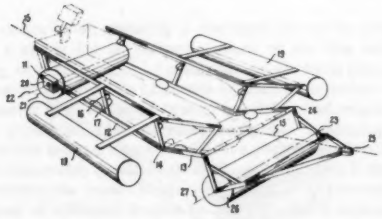
**BOAT LAUNCHING AND RECOVERY VEHICULAR DEVICE**

**Otis R. Pannell, and Roy H. Peterson, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 6, 1972, Ser. No. 241,726**

**Int. Cl. G60p 3/10**

**U.S. Cl. 9—1 T** **4 Claims**



This invention is a lightweight, air transportable vehicular device for launching and recovering a motor surf boat or the like through heavy surf. The vehicle is adaptable to both sloped beach and beachless waterfront conditions and requires a low pulling or pushing force for launching and recovery.

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**3,744,073**

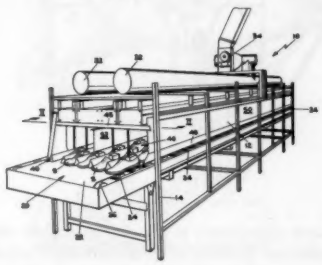
**HEAT SETTING APPARATUS**

**George H. Nelson, Rockford; Jerry L. Boomers, Grand Rapids, and Robert B. Egtvedt, Comstock Park, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.**

**Filed Jan. 13, 1972, Ser. No. 217,535**

**Int. Cl. A43d 00/00**

**U.S. Cl. 12—1 A** **8 Claims**



Apparatus for heat setting shoe uppers to conform to a shoe last in a heating chamber by means of direct and indirect radiant energy. Reflective triangular shaped guide ways extend along the length of a conveyor upon which lasts and uppers are transported to provide for both direct and indirect radiation of the energy to the shoes carried on the conveyor. The energy source is positioned above the conveyor to direct the rays downwardly toward the top of the shoe, providing the direct radiation while at the same time the reflected or indirect radiation from the reflective guide ways acts upon the sides of the shoe.

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**3,744,074**

**SHOE LAST WITH INSOLE ATTACHMENT MEANS**

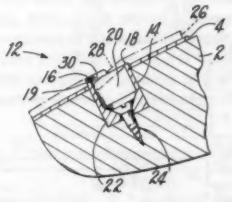
**Peter L. Stapleton, Leicester, England, assignor to USM Corporation, Boston, Mass.**

**Filed Oct. 21, 1971, Ser. No. 191,372**

**Claims priority, application Great Britain, Oct. 27, 1970, 50,918/70**

**Int. Cl. A43d 21/00, 3/00**

**U.S. Cl. 12—145** **10 Claims**



A shoe last having an embedded hollow member provided with a cutting edge projecting from the last bottom for cutting a tab in an insole forceably applied to the last bottom for holding the insole registered on the last bottom. A method for temporarily securing an insole on a last bottom in which the cut tab is received in the hollow member.

**3,744,075**

## DISENGAGEABLE CONNECTION FOR DRAWBRIDGE GIRDERS

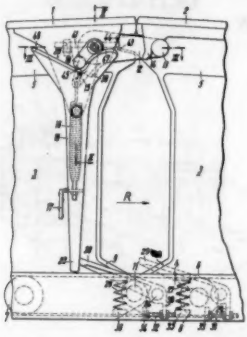
**Dieter Zaremba, Stuttgart, Germany, assignor to Firma Dr. Ing. H.c.F. Porsche K.G., Stuttgart-Zuffenhausen, Germany**

**Filed Apr. 19, 1971, Ser. No. 135,220**

**Claims priority, application Germany, Apr. 17, 1970, P 20 18 476.3**

**Int. Cl. E01d *1/00***

**U.S. Cl. 14—1** **15 Claims**



An automatic locking installation for the disengageable connection of the upper girders of two-partite drawbridges whose bridge parts are adapted to be transported, one disposed above the other, on a carrier vehicle and are adapted to be loaded and unloaded by means of a pivotal boom mounted at the carrier vehicle, whereby locking members are provided pivotally arranged against a spring force which are positively guided by control levers released by spring loaded abutments arranged at the boom and are further influenced by feelers controlled by the position of the associated bridge part.

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**3,744,076**

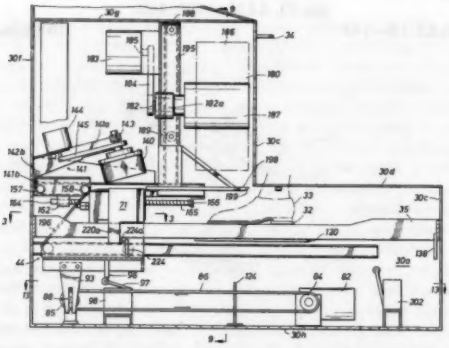
## AUTOMATIC SHOE POLISHING MACHINE

**James N. Mullins, Jr., P.O. Box 4398, Fort Worth, Tex.**

**Filed Apr. 26, 1971, Ser. No. 137,337**

**Int. Cl. A47l *23/02***

**U.S. Cl. 15—31** **23 Claims**



An automatic shoe polishing machine is provided for polishing a shoe. The shoe, while on the foot of the wearer, is placed on a shoe support in an opening in the machine housing. Rotating side polish application brushes pick up polish from a dispenser and move along the sides of a shoe applying polish to the shoe. Rotating side buffing brushes follow the applicator brushes. After applying the polish, the applicator brushes move out of contact with the shoe so they will not contact the shoe as the are returned to their starting position. A brush applies polish to the toe of the shoe after which another brush buffs the toe. The movement of the brushes is coordinated by having the movement of the two toe brushes controlled by movement of the side brushes. The applicator brushes pick up polish from cavities in a polish dispensing body just before they move into contact with the shoe. The cavities are closed except when dispensing polish to keep the polish from being exposed to the drying effect of the air when the machine is not in operation.

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**3,744,077**

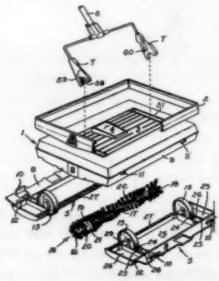
## CARPET SWEEPERS

**Donald Nation Smyth, South Plympton, Australia, assignor to S. A. Brush Company Limited, Albert Park, Australia**

**Filed July 7, 1971, Ser. No. 160,422**

**Int. Cl. A47l *11/08***

**U.S. Cl. 15—41 R** **9 Claims**



A carpet sweeper in which the brush sweeps over the whole width of the sweeper so that the sweeper can brush the carpet right up to the edge of the wall. The brush is driven by the supporting wheels on a crank mechanism so that increase of pressure on the operating handle gives greater driving force between the wheels and the brush. Also the brush is self-adjusting for height, the handle applying pressure to the brush. The wheels are attached to the dust trays and hence move with the dust trays hinged about the front and rear edges of the sweeper as the trays are opened and closed by a single operating member.

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**3,744,078**

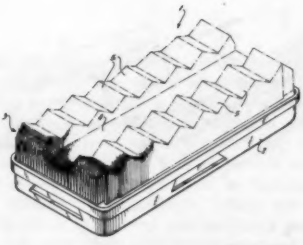
## NAILBRUSH

**Joseph Vallis, 353 Cortleigh Boulevard, Toronto, Ontario, Canada**

**Filed July 14, 1971, Ser. No. 162,343**

**Int. Cl. A46b *15/00*, *9/00***

**U.S. Cl. 15—167 R** **6 Claims**



A nailbrush has a backing element from which a plurality of slender bristles project. The free tips of the bristles together

define a cleaning face and the bristles are of differential length so that the cleaning face has a longitudinally extending depression and a plurality of transversely extending depressions with the former being deeper than the latter.

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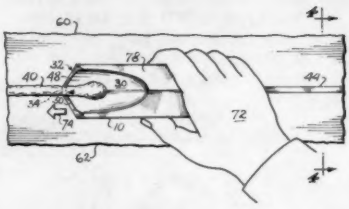
**3,744,079**
**CAULKING CLEAN-UP TOOL**
**Wilbur Krause, 16465 N.E. 180th Place, Woodinville, Wash.**
**Filed Apr. 10, 1972, Ser. No. 242,480**
**Int. Cl. E04f** *21/32*
**U.S. Cl. 15—235.7** **7 Claims**




A caulking tool for applying caulk material at a seam located at the right angle intersection of two walls. The tool is provided with a V-shaped cross-sectional configuration made of two integrally connected flanges of resilient semi-soft material disposed at a larger than 90° angle from one another so that forced insertion between said two walls will produce a seal-tight connection between walls and flanges for removal of excess caulking material and for pressing of the caulking material in the seam. The intersection of the flanges is slightly flattened at the apex so that an approximate 45° evenly-pressed and smoothed bead of caulking material remains when the tool is moved between the walls over the approximately disposed caulking material at the seam.

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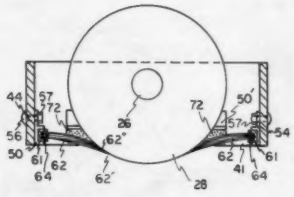
**3,744,080**
**CASTER BRUSH ASSEMBLY**
**James S. Smith, Jr., 2443 Armstrong Circle, Gastonia, N.C.**
**Filed Aug. 4, 1971, Ser. No. 168,947**
**Int. Cl. B60b** *33/00*
**U.S. Cl. 15—256.51** **9 Claims**




A caster brush assembly is disclosed for use in conjunction with a caster for an industrial truck or the like where lint, string, or other unwanted materials are apt to be picked up by the caster or wheel and become secured or embedded around the caster so as to impede caster operation and create cleanliness problems. The assembly comprises a housing that is securable around a caster and has a plurality of bristle assemblies removably attached thereto, and extending inwardly and contacting the caster. Bristles of certain of said assemblies are, in part, of different lengths so as to provide a tapered bristle surface against the contact area with the caster. A smooth surface is thus provided to shear unwanted materials away from the caster as they are picked up off the floor. It is preferred to provide bristles on all four sides of the caster within the housing so as to completely enclose the caster. A brush assembly per se is also claimed as is an industrial truck being equipped with the caster brush assembly. The housing is conveniently removable from the caster when cleaning is required.

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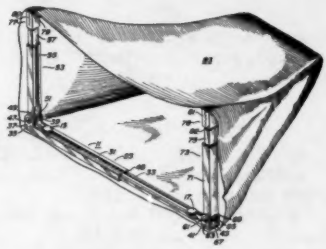
**3,744,081**
**LEAF COLLECTION CONTAINER SUPPORT**
**Ann Miller, 810 High St., Bethlehem, Pa.**
**Filed July 19, 1971, Ser. No. 163,726**
**Int. Cl. B65f** *1/04*
**U.S. Cl. 15—257.1** **12 Claims**



A plastic leaf collection bag is temporarily secured to the ground while supported with its opening extending substantially vertically by an adjustable frame means in position to allow leaves to be conveniently swept into the bag.

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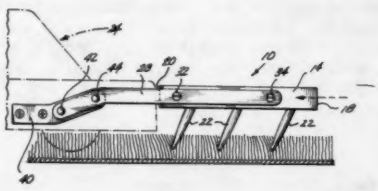
**3,744,082**
**VACUUM CLEANER AND RAKE**
**Alfred G. Marshall, P. O. Box 201, Woodburn, Oreg.**
**Filed Nov. 5, 1971, Ser. No. 195,922**
**Int. Cl. A47l** *9/06*
**U.S. Cl. 15—402** **3 Claims**




A vacuum cleaner and rake combination. The rake includes a frame having tines mounted thereon and projecting downwardly therefrom. Such rake is secured to the vacuum cleaner with the frame positioned in advance of the vacuum cleaner housing, whereby it moves in the path of the cleaner housing on movement of the vacuum cleaner. Multiple rows of tines are provided with the tines of the various rows staggered. The tines incline toward the housing of the vacuum cleaner in projecting downwardly from the frame.

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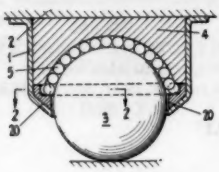
**3,744,083**
**CASTORS**
**Albert William Jenkins, 8 Longbrae Court, Forest Hills, Victoria, Australia**
**Division of Ser. No. 708,371, Feb. 26, 1968, Pat. No. 3,557,401. This application Nov. 9, 1970, Ser. No. 88,016**
**Claims priority, application Australia, Feb. 28, 1967, 18275/67**
**Int. Cl. B60b** *33/08*
**U.S. Cl. 16—26** **5 Claims**

The invention provides an improved castor of the type having a plurality of small balls disposed in a space for dual rolling

contact between a load supporting large ball and a housing skirting and retaining the large ball and the housing is constructed to allow free movement of the small balls in the space whereby clustering and resultant jamming of the small balls is prevented.



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**3,744,084**

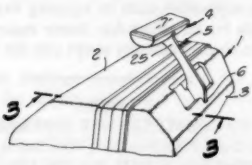
**RETRACTABLE HANDLE FOR CASE**

**Cyril E. Fankhouser, Costa Mesa, Calif., assignor to Technicolor, Inc., Hollywood, Calif.**

**Filed May 14, 1971, Ser. No. 143,449**

**Int. Cl. A47b *95/02***

**U.S. Cl. 16—114** **15 Claims**



A carrying case and handle assembly are disclosed in which the handle assembly is mounted on the interior of the housing of the carrying case. The carrying handle extends through the housing and is movably retained therein and adapted to extend above the case when in the carrying position. The carrying handle includes spring means to retract the same when the case is at rest.

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**3,744,085**

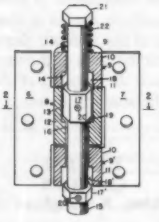
**LOCKABLE HINGE**

**Steven J. Griego, 635 Gene Avenue, N.W., Albuquerque, N. Mex.**

**Filed Dec. 29, 1971, Ser. No. 213,633**

**Int. Cl. E05d *11/10***

**U.S. Cl. 16—144** **7 Claims**



A structural hinge having at least two leaves provided with registering barrels and an axially movable hinge pin inserted through said barrels, each of the barrels having an internal cylindrical journal portion and an internal polygonal socket portion, said hinge pin having corresponding cylindrical portions and polygonal in cross section plug portions, the socket portions in alternate barrels being of sufficient depth so that the plug portions of the hinge pin are completely nested in said alternate barrels when the hinge pin is in one extreme axial position and each plug portion engages adjacent socket positions when the hinge pin is in other axial positions whereby the hinge leaves are angularly movable with respect to each other, or are locked in a selected angular condition, respectively.

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**3,744,086**

**DEVICE FOR CONCEALED LINKED HINGES, APT TO AUTOMATICALLY HOLD A DOOR, CABINET DOOR OR FLAP DOOR SHUT**

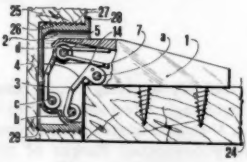
**Luciano Salice, Cantu, and Silvio Serin, Padova, both of Italy, assignors to S.P.A. Arturo Salice, Milan, Italy**

**Filed June 8, 1971, Ser. No. 15,106**

**Claims priority, application Italy, Nov. 9, 1970, 41652 A/70; Mar. 29, 1971, 22425 A/70**

**Int. Cl. B14c *29/00***

**U.S. Cl. 16—164** **10 Claims**



A device for holding a door shut, incorporated in a concealed hinge embodying the kinematic system for an articualted quadrilateral comprising a V-shaped flexure spring having at its apex an eyelet by which said spring is secured to one of the four pivoting pins of the hinge.

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**3,744,087**

**DEVICE FOR MAKING A CUT INTO THE BODY OF POULTRY**

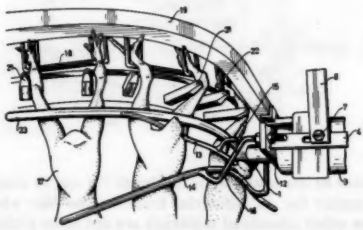
**Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork-Amsterdam N.V., Amstedveen, Netherlands**

**Filed Oct. 19, 1970, Ser. No. 81,885**

**Claims priority, application Netherlands, Oct. 16, 1969, 6915661**

**Int. Cl. A22c *21/00***

**U.S. Cl. 17—11** **6 Claims**



A device for making a transverse cut between the tail and the anus of the body of a bird which is suspended by its legs from a conveyor track. The device has a cutting disk and a support which can tilt the device about a first horizontal axis and about a second axis, above and parallel to the first axis. Two guide members are connected to the support. The first guide member is in the proximity of the cutting disk and at a short distance above the lower edge of the disk and the second guide member being spaced downwardly from the first guide.

## 3,744,088
## VAPORIZING APPARATUS FOR TREATMENT OF ANIMAL CARCASSES

Bryan T. Snowden, Grapevine, Tex., assignor to FEI, Inc., Dallas, Tex.

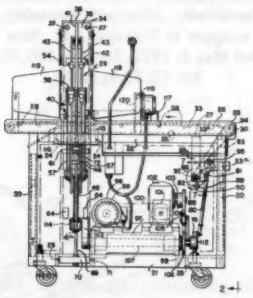
Filed Mar. 22, 1971, Ser. No. 127,005
Int. Cl. A22c 21/04
U.S. Cl. 17—11.2 4 Claims

A compartmented housing is inclined at a predetermined angle relative to the horizontal, with a path being defined through the housing for travel of animal carcasses, such as poultry, therethrough. Spray nozzles project from a generally smooth inner surface of the housing for directing high temperature steam upon preselected portions of the animal carcasses. The entry of ambient air into the housing is regulated to maintain a desired temperature within the housing. A prewetting station initially wets the animal carcasses prior to entry into the compartmented housing.

## 3,744,089
## MEAT TENDERIZER

Fred Fetzer, Strongsville, and Ronald P. Miranda, Sandusky, both of Ohio, assignors to Bettcher Industries, Inc., Birmingham, Ohio

Division of Ser. No. 17,668, March 9, 1970, Pat. No. 3,654,664. This application Feb. 4, 1972, Ser. No. 223,501
Int. Cl. A22c 9/00
U.S. Cl. 17—25 2 Claims

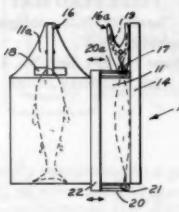


As a meat product travels intermittently along a horizontal conveyor belt by fixed increments, a plurality of downwardly directed tenderizing knives having cylindrical shanks and wide, flat, pointed blades at the lower end having inclined side cutting edges carried by a vertically reciprocating ram carriage are moved from a position above the meat downwardly through the meat and then withdrawn upwardly. A stripper carriage associated with the ram carriage follows the latter during its downward stroke leaving a stripper frame resting on top of the meat. The stripper frame is locked in that position until the tenderizing knives move upwardly out of the meat, at which time the stripper frame is unlocked and moves upwardly propelled by the ram carriage. Timing means causes said conveyor belt to move only when said blades are clear of said meat. Means is provided for varying the increment of conveyor belt travel while the machine is running.

## 3,744,090
## FISH-SUPPORTING AND HOLDING DEVICE

Robert C. Burke, 1103 Richard St., Miamisburg, Ohio

Filed Dec. 7, 1970, Ser. No. 95,520
Int. Cl. A22c 25/06
U.S. Cl. 17—70 4 Claims

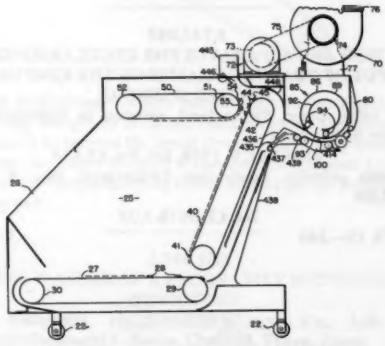


A table-like support member has fixed thereto an upstanding member with a second upstanding member movably mounted on the support member for reciprocable movement toward and away from the fixed upstanding member for holding the body of a fish in a vice-like manner during fish cleaning operations. Fish-clamping means are fixed to the support member and also to the fixed upstanding member. The support member includes a drawer for fish-cleaning implements.

## 3,744,091
## MAT FORMING APPARATUS FOR FIBER WEB FORMING MACHINE

Dennis E. Wood, Penfield, N.Y., assignor to Curlator Corporation, Macedon, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,736
Int. Cl. D01g 25/00
U.S. Cl. 19—156.3 7 Claims



This machine includes a moving condenser and an undercarriage having a solid plate confronting a part of the perimeter of the condenser. The condenser may be a rotating foraminous screen, or an endless foraminous belt. There is a duct inside the condenser, through which air is sucked to draw fibers onto the screen, and an adjustable baffle for determining the effective area of this duct. Fibers are sucked into the space between the plate and condenser by the air flowing through the condenser and compacted into a web by the moving condenser. In one embodiment of the invention an air intake box and an adjustable flap increase the stripping action

on the pins of an apron in a feed hopper to deliver fibers between the undercarriage and condenser. In this embodiment also means is provided for varying the throat opening of the air bridge which carries the fibers from this apron between undercarriage and condenser. In another embodiment of the invention, to control the mat thickness the undercarriage is bodily adjustable relative to the condenser which here is an endless screen belt.

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**3,744,092**

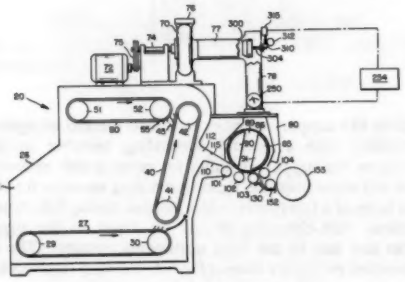
**APPARATUS FOR CONTROLLING THE DENSITY OF A FIBER FEED MAT**

**Charles R. Auten, Charlotte, N.C., assignor to Curlator Corporation, East Rochester, N.Y.**

**Filed June 7, 1971, Ser. No. 150,281**

**Int. Cl. D01g** *25/00*

**U.S. Cl. 19—156.3** **6 Claims**



For controlling its fiber density during formation of a mat that is to be fed to the lickerin of a card or web forming machine, a pressure gauge is connected to the inlet duct of the suction fan that causes fibers to be drawn from a feed mechanism and laid down on a condenser to form the mat; and this gauge is geared to a pivoted or reciprocable damper in the duct to control air flow in the duct, thereby to control the density of the mat. The control damper may be positioned either at the inlet or the outlet side of the fan.

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**3,744,093**

**METHOD AND APPARATUS FOR REGULARIZING THE OUTPUT OF DRAWING FRAMES OF THE KIND USED IN TEXTILE SPINNING**

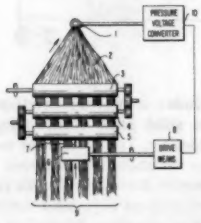
**Ernst Felix, Uster, Switzerland, assignor to Zellweger Ltd., Uster, Switzerland**

**Filed Nov. 9, 1970, Ser. No. 87,874**

**Claims priority, application Switzerland, Dec. 9, 1969, 18292/69**

**Int. Cl. D01h** *5/38*

**U.S. Cl. 19—240** **9 Claims**




Method and apparatus for regularizing the output of drawing frames of the type used in the textile spinning industry. At least one of the slivers delivered to the drawing frame is passed through a pair of cylinders having a rotational speed controlled by a measuring signal generated by a measuring element corresponding to the overall cross section of the output of the drawing frame.

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**3,744,094**

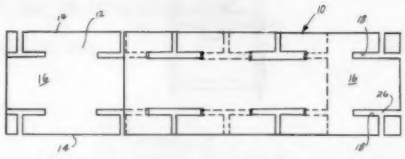
**INTERLOCKING TIE STRIP**

**William C. Bach, 446 San Vincente Boulevard, Apt. 105, Santa Monica, Calif.**

**Filed Oct. 26, 1971, Ser. No. 192,292**

**Int. Cl. 24** *30.5*; **B65d** *63/12*

**U.S. Cl. 24—16 PB** **8 Claims**



A one piece interlocking tie strip for use in securing plants, packages and the like. The strip is provided in one of several embodiments each of which incorporates spaced perforations located longitudinally along the tie strip with repetitive spacing relationships. In one embodiment perforations are located along each lateral edge and define complementary interlockable T-shaped cutouts and T-shaped tabs. In another embodiment perforations of two different types alternate along the longitudinal axis of the strip and are located intermediate the edges of the strip, such alternate perforations having a complementary configuration to provide an interlock when one portion of the strip is longitudinally or laterally overlaid on another remote portion of the strip. Duplicate arrangements of the spaced, alternating, interlockable perforations of the second embodiment, the perforations being located along each lateral edge of the strip, are also utilized in a third embodiment.

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**3,744,095**

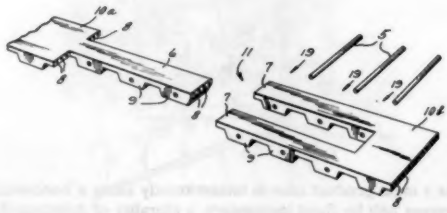
**SPLICE FOR TOOTHED POWER TRANSMISSION BELTS**

**Edward G. Tomlinson, Abington Township, Montgomery County, Pa., assignor to Uniroyal, Inc., New York, N.Y.**

**Filed May 4, 1972, Ser. No. 250,393**

**Int. Cl. F16g** *3/02*

**U.S. Cl. 24—38** **4 Claims**

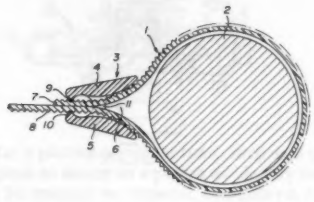


A splice for toothed power transmission belts having connecting pins for holding the abutting ends of the belt together. The connecting pins each pass through a tooth of the belt in the splice region. The pin is placed in adjacent proximity to the tension cords in the belt so that these reinforcement cords will acquire the load transmitted to the pin. As a result, a stronger and more durable splice is achieved. The above splice may also be used for repairing damaged or worn belts by inserting a new piece of belt having a splice at each end.

**3,744,096**
**BINDER**

**Albertus Jacobus Theodorus Kok, Nyon, Switzerland, assignor to IPP Industrial Polymer Processing S.A., Vaud, Switzerland**

**Filed Jan. 28, 1972, Ser. No. 221,676**
**Claims priority, application Switzerland, Feb. 1, 1971, 1446/71**
**Int. Cl. B65d** *63/00*
**U.S. Cl. 24—16 PB** **8 Claims**



The invention provides a binder having a plastics strap of indefinite length formed with notches over its entire length to define locking positions for a separate blocking device having a member formed with a passage for the two end portions of the strap and locking teeth for engaging in the notches of the strap. The strap may for instance be made by extruding a continuous plastics tape and passing the tape between a pair of rollers of which one is provided with notch-forming teeth over its circumference, the tape being subsequently cut into straps of required length.

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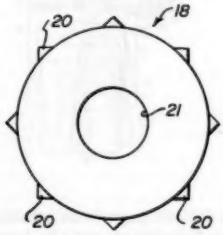
**3,744,097**
**METHOD AND APPARATUS FOR TUFTING UPHOLSTERY AND THE LIKE**

**Stephan C. Shepherd, Winnetka, Ill., assignor to Maxanf Button & Supply Co., Chicago, Ill.**

**Filed Apr. 6, 1971, Ser. No. 131,714**
**Int. Cl. A44b** *1/18, 9/00;* **A47c** *27/00*
**U.S. Cl. 24—90 B** **5 Claims**



A device and method for reinforcing the holes made through fabric by the fastening devices used in tufting upholstery and the like.

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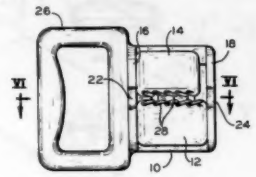
**3,744,098**
**LINE GRIPPING DEVICE**

**Thomas S. Bowers, Lake Forest, Ill., assignor to A. L. Hansen Mfg. Co., Gurnee, Ill.**

**Filed June 23, 1971, Ser. No. 155,778**
**Int. Cl. F16g** *1/00*
**U.S. Cl. 24—136 R** **4 Claims**

This disclosure pertains to a line gripping device such as a rope puller, a wire puller, or a cleat. The line gripping device utilizes both the camming and the jamming action. More particularly, the disclosure illustrates a handle attached to a base with a first jaw member adjustably but firmly attached to the base. A second jaw member is mounted on the base adjacent the first jaw member with the gripping teeth of the jaw members spaced apart a sufficient distance to permit a rope to be inserted therebetween. The second jaw member is mounted for movement toward and away from the first jaw member by a cam-follower arrangement so that the first and second jaw



members are constantly maintained in a parallel relationship. Accordingly, tension on a line placed between the jaws causes a camming operation to force the jaws together to grip the line while the angular relationship of the teeth causes the line to be jammed between the jaws. In another embodiment of the disclosure, the jaws are mounted on a base which is secured by screws to a deck of a vessel so as to form a combination jam-cam cleat.

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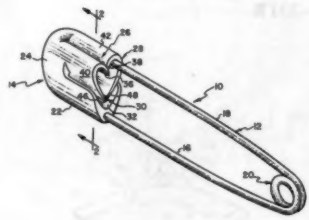
**3,744,099**
**SAFETY PIN**

**Horace S. McCoy, 11203 Lonewood Circle, Dallas, Tex.**

**Filed Aug. 2, 1971, Ser. No. 167,923**
**Int. Cl. A44b** *9/12*
**U.S. Cl. 24—156 R** **9 Claims**



There is disclosed a safety pin having a keeper thereon for captivating the pin in a closed configuration. The keeper is constructed to receive the point through a one-way entry and to release the point through a one-way exit. Means are provided to cam the pin laterally following its passage through the one-way exit.

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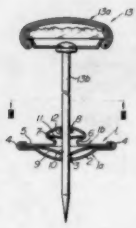
**3,744,100**
**FIXING WASHER OF A DECORATIVE BUTTON FOR FURNITURE**

**Morio Katayama, c/o Gondora Kogyo Co., Ltd., 9-7 Higashinihonbashi 1-chome, Chuo-ku, Tokyo, Japan**

**Filed Dec. 29, 1971, Ser. No. 213,650**
**Int. Cl. A44b** *1/18*
**U.S. Cl. 24—152** **4 Claims**

A fixing washer, for engaging the shank of a decorative button for upholstered funiture, has a front plate with a substantially flat periphery and a central outwardly convex dome portion formed with a central aperture for the shank. A backplate has a substantially flat seating portion whose periphery is clamped by an inturned peripheral flange on the front plate, and the backplate is formed with a central projection extending axially from tha backplate, this central projection being essentially tubular and being radially enlarged intermediate its ends, and is formed with a dome portion at its outer end also

having a central aperture for the shank. A first resilient plate is peripherally clamped between the front and back plates and is formed with a central aperture having a diameter a little less than that of the shank. A second resilient plate has its periphery engaged in the radially enlarged portion of the projection of the backplate, so that it is spaced axially from the first resilient plate, the second resilient plate having a diameter substantially less than that of the backplate and being formed with a central aperture having a diameter a little less than that of the shank of the decorative button.



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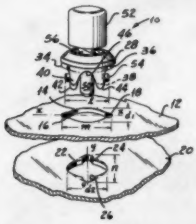
**3,744,101**

**DETACHABLE QUARTER-TURN BLIND HOLE FASTENER**

**Paul R. Gley, Hillsdale, N.J., assignor to Rex Chainbelt Inc., Milwaukee, Wis.**

**Filed May 11, 1971, Ser. No. 142,153**
**Int. Cl. A44b *17/00***
**U.S. Cl. 24—221 K** **4 Claims**



A detachable blind hole quarter-turn fastener for securing a panel to a frame in which means are provided for detachably securing the fastener to the panel in response to a quarter-turn of the fastener cross pin stud in one direction and for detachably securing the panel to the frame in response to a quarter-turn of the cross pin stud in the other direction.

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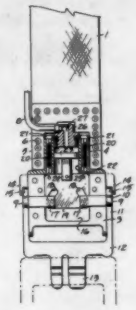
**3,744,102**

**STRAP CONNECTOR RELEASE**

**John A. Gaylord, Greenbrae, Calif., assignor to H. Koch & Sons, Inc., Corte Madera, Calif.**

**Filed Feb. 22, 1972, Ser. No. 228,147**
**Int. Cl. A44b *19/00***
**U.S. Cl. 24—230 A** **9 Claims**

In the strap connector release in this illustration, the male connector has a U-shaped forked frame which straddles a casing and is locked to the casing by opposite pins slideably extended through the sides of the casing into holes in the legs of the U-shaped frame. Means are provided in the casing actuated by gas pressure to pull the pins inwardly of the casing and out of the holes of said legs, thereby releasing the male strap connector.



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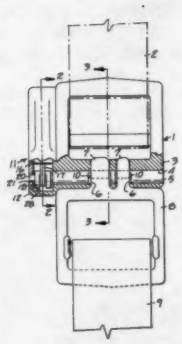
**3,744,103**

**LOCK AND RELEASE FOR STRAP CONNECTOR**

**John A. Gaylord, Greenbrae, Calif., assignor to H. Koch & Sons, Inc., Corte Madera, Calif.**

**Filed Feb. 22, 1972, Ser. No. 228,148**
**Int. Cl. A44b *19/00***
**U.S. Cl. 24—230 A** **6 Claims**



This lock and release is for the rocking shaft of the type of strap connector used on parachutes, for instance, of the type shown in U.S. Pat. No. **3,183,568,** wherein a rocking shaft has a cut away portion to permit the insertion of the prongs of the male connector and then it is turned into a notch in the prongs of the male connector for locking the male connector in the female connector. The rocking shaft is locked in place by a lever at a reduced end thereof and a gas actuator valve and plunger pushes a spring pressed bolt out of a keeper to free the lever and the rocking shaft for rotation and substantially simultaneously with the freeing to admit the gas pressure into a cylinder to move a piston against the action of a spring, which piston is connected to said lever to rock the lever and the rocking shaft into prong releasing position. The coil spring in the cylinder automatically returns the piston into its initial position and thereby rocks the lever and the shaft into locking position whereupon the spring pressed bolt pushes the plunger and the valve back into the initial locking position.

**3,744,104**

## NON-RELEASABLE CLASP

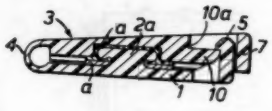
**David Julian Ford, Stapleford, England, assignor to TRW Incorporated, Cleveland, Ohio**

**Filed Jan. 31, 1972, Ser. No. 221,909**

**Claims priority, application Great Britain, Feb. 10, 1971, 4,371/71**

**Int. Cl. A44b *21/00*; G09f *3/14***

**U.S. Cl. 24—248 SL** **2 Claims**




A clamp for a plastics or similar band, such as is commonly used in hospitals to secure to a person an identity tag which is intended to be resistant to removal, comprises a base and a clamping member moulded integrally with a hinging web from synthetic plastics material, the base carrying a post over which one end of the band is impaled and secured by upsetting the end of the post, and the clamping member being hingeable towards the base to clamp the free end of the band which in use is laid across the base. Co-operating lip and tongue means are provided to secure the base and clamping member together in non-releasable manner.

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**3,744,105**

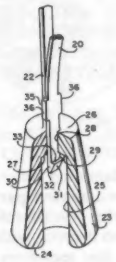
## DRAWSTRING CONSTRUCTION

**Joseph N. Laurita, Maspeth, N.Y., assignor to A. Rifkin Co., Wilkes-Barre, Pa.**

**Filed Mar. 10, 1972, Ser. No. 233,512**

**Int. Cl. A41f *1/00***

**U.S. Cl. 24—266** **2 Claims**




A drawstring including an elongate flexible element for extension about the neck of a bag, an enlarged gripping member on one end of the elongate element, and a retaining member on the other end of the elongate element configured for interfitting engagement with the gripping member for retention of the elongate element about the neck of the bag.

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**3,744,106**

## APPARATUS FOR STRETCHING PLASTIC SHEET MATERIAL

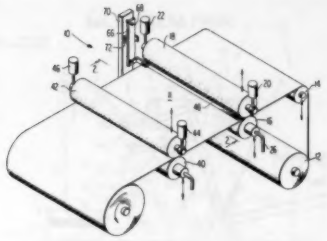
**Sidney J. Baum, Encino, and Anton J. Mayr, Canoga Park, both of Calif., assignors to Foster Grant Co. Inc., Leominister, Mass.**

**Filed Nov. 23, 1971, Ser. No. 201,337**

**Int. Cl. D06c *3/06***

**U.S. Cl. 26—54** **9 Claims**

An apparatus for longitudinally stretching a continuous web of extensible material such as thermoplastic sheeting to produce a highly uniform stretch oriented film for use in the production of high quality optical elements. The web is stretched by applying a tensile stress to a length of the film moving between a pair of driven pinch-type restraining rolls



and one or more pulling rolls driven at a rate greater than that of the restraining rolls to impart the desired degree of elongation. Softening heat is applied to the top surface of the film as the film emerges from the nip of the restraining rolls.

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**3,744,107**

## TENTER CLIP

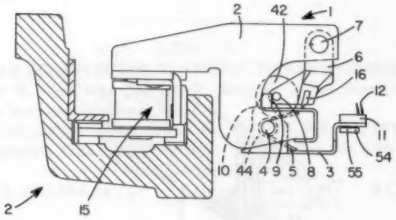
**Derek Mitchell, Larkhall, Scotland, assignor to Proctor and Schwartz, Inc., Philadelphia, Pa.**

**Filed June 17, 1971, Ser. No. 154,115**

**Claims priority, application Great Britain, Sept. 9, 1970, 43,166/70**

**Int. Cl. D06c *3/10***

**U.S. Cl. 26—62 C** **7 Claims**




A clip construction having a body, a pinplate support, and a gripper with the body comprising a pair of sheet metal stampings which are formed and welded together. The pinplate support conveniently secures a pinplate and is so configured in relation to the gripper, both of which being pivotally secured to the body, that the gripper alone locks the pinplate support in operative position.

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**3,744,108**

## METHOD AND APPARATUS FOR MAKING ROD-SHAPED FILLERS FOR CIGARETTE FILTERS OR THE LIKE

**Heinz Greve, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany**

**Filed July 16, 1971, Ser. No. 163,376**

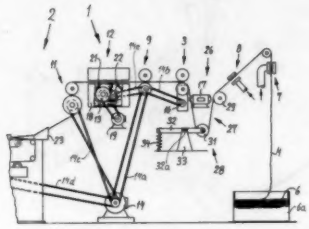
**Claims priority, application Germany, July 23, 1970, P 20 36 486.7**

**Int. Cl. D01b *3/04***

**U.S. Cl. 28—1 CF** **10 Claims**

A tow which consists of filamentary filter material and is being converted into a continuous rod-like filler prior to wrapping to form a wrapped filter rod is being withdrawn from a bale wherein the filaments of the tow are likely to become interlaced or entangled with attendant short-lasting changes in tensional stresses upon the tow. Such short-lasting changes in the tensional stresses are damped upstream of the point where

the tow is engaged by a pair of advancing rollers to insure that the tension in those increments of the tow which advance beyond such rollers is substantially constant. The damping action can be brought about by a roll which rests in a loop of the tow between the advancing rollers and the bale and which is



biased by a spring which compensates for the weight of the roll. The latter rises in response to increasing tension in the loop to reduce the length of such loop and descends in response to decreasing tension of the loop to thereby lengthen the loop at a speed which is preferably proportional to the extent of changes in the length of the loop.

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**3,744,109**

**HEALD SEPARATING APPARATUS**

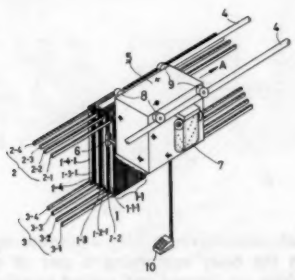
**Takao Dohi, and Nobuhisa Oishi, both of Shiga, Japan, assignors to Todo Seisakusho Ltd., Kyoto-shi, Japan**

**Filed May 11, 1971, Ser. No. 142,300**

**Claims priority, application Japan, May 14, 1970, 45/41398**

**Int. Cl. D03j *1/14***

**U.S. Cl. 28—46** **1 Claim**



A specified heald is separated automatically from groups of the healds in a predetermined order stored in a punched tape.

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**3,744,110**

**SIZING AND DRYING SECTIONAL WARPING MACHINE**

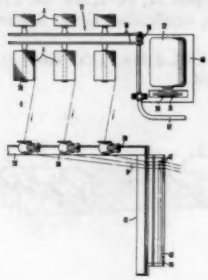
**Hirohito Baba, Osaka, and Toshiyuki Takase, Nishiwaki, both of Japan, assignors to Baba Snagyo Kikai Kabushiki Kaisha, Osaka-Fu and Naigai Orimona Kabushiki Kaisha, Nishiwaki-shi, Hyogo-ken, Japan**

**Filed Oct. 1, 1971, Ser. No. 185,661**

**Int. Cl. D03j *1/02***

**U.S. Cl. 28—28** **4 Claims**

A sizing and drying sectional warping machine. The machine has a set of plural creels movable for replacement in a direction intersecting the travelling direction of the warp. A sizing apparatus for the warp passing between the front sectional warping machine and the winding device and a drying apparatus are provided and the portions of both the sizing and the drying apparatus through which the warp passes are constructed so as to have one-end-support, so that the warp can be loaded while holding the warp passing through the front reed on the side as it is. While sizing, drying and sectional warping are carried on in one creel, in the other creel replace-



ment of the bobbin and the piece of warp are performed to prepare for next operation. By replacement of the creel the next sizing, drying and sectional warping operation can be carried out immediately.

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**3,744,111**

**ROLL FOR A DAMMING ROLLER TRAIN**

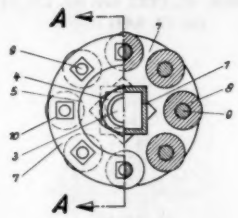
**Karl Stumpf, Worringerstrasse 78, Dusseldorf, Germany**

**Filed Apr. 6, 1972, Ser. No. 241,705**

**Claims priority, application Germany, Aug. 16, 1971, P 21 40 921.2**

**Int. Cl. B21b *13/02***

**U.S. Cl. 29—116 R** **10 Claims**



A roll for use in a damming roller train includes a central shaft having at least two spaced parallel disc members connected therewith. A series of small rollers surround the central shaft, in parallel relation thereto, with such small rollers being mounted between the disc members. The frictional pressure on the small rollers is adjusted to normally prevent as such small rollers from rotating as revolve about the central shaft, during the conveying of material along the roller train. However, when the flow of material along the roller train is dammed, the frictional pressure on the small rollers is overcome and such small rollers rotate about their rotational axes.

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**3,744,112**

**MACHINE FOR MANUFACTURING PLATE SUBASSEMBLIES FOR ELECTRIC STORAGE BATTERIES**

**Hans-Georg Lindenberg, Hannover-Stocken, and Siegfried Prause, Berenbostel, both of Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed May 5, 1971, Ser. No. 140,531**

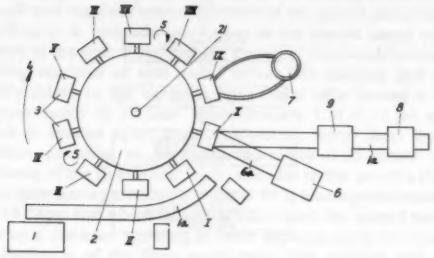
**Claims priority, application Germany, May 6, 1970, P 20 22 163.0**

**Int. Cl. H01m *35/18*; B23p *19/04***

**U.S. Cl. 29—204** **10 Claims**

A machine for producing electrode-plate blocks for electric storage batteries comprises a table stepwise rotatable about a

vertical axis, peripherally distributed axles mounted on the table and protruding radially therefrom, respective cassettes mounted on the outward ends of the respective axles and having the shape of bilaterally open block boxes with cell partitions which have slots for insertion of loose plate blocks into the slots, work stations arranged about the table and correlated to the respective cassettes, one of the respective stations



having means for orienting the electrode-plate connector lugs, a second having means for treating the lugs with fluxing medium, a third having a casting device for joining cell connectors and pole bridges with the lugs of equipolar electrode plates of the blocks, and a work station with a press device for pressing the interconnected plate blocks through the cassette into block housings arranged beneath the cassette to produce a storage battery.

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**3,744,113**

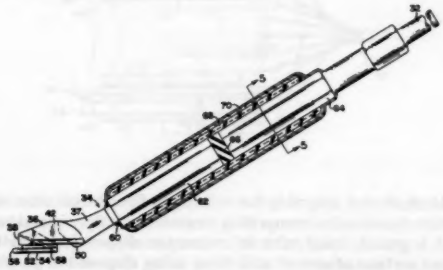
## LOCK STRIP INSERTING TOOL

**J. Thomas Sarvay, and Michael M. Orend, both of Lakewood, Ohio, assignors to The Standard Products Company, Cleveland, Ohio**

**Continuation of Ser. No. 754,235, Aug. 21, 1968, abandoned. This application Mar. 22, 1971, Ser. No. 127,050**

**Int. Cl. B23p *19/04***

**U.S. Cl. 29—235** **7 Claims**



A lock strip inserting tool having a shank specially adapted for power operation and including a split shank construction with a resilient spacer and sleeve interconnecting the shank portions. This construction damps the impact load and vibratory frequency without reducing the stroke of the tool.

**3,744,114**

## SWAGING TOOLS

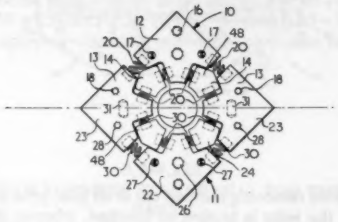
**Gordon Thomas Melsom, Gateshead, England, assignor to Dunlop Holdings Limited, London, England**

**Filed Sept. 24, 1970, Ser. No. 75,137**

**Claims priority, application Great Britain, Oct. 9, 1969, 49,655/69**

**Int. Cl. B23p *19/04***

**U.S. Cl. 29—237** **6 Claims**



A swaging tool, for assembling hose to couplings, which permits a limited range of hose sizes to be swaged with one tool, while avoiding the undesirable formation of lobes, which lead to leaks. The tool has a plurality of outer dies arranged around one axis, the outer dies moving in a radial direction on opening and closing of the tool. Positioned between the outer dies are insert which also move in a radial direction on opening and closing of the tool. Both the dies are in contact with the hose assembly when the tool is closed, of which the following is a specification.

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**3,744,115**

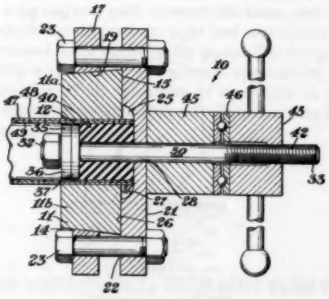
## APPARATUS FOR THE FLANGING OF LINED CONDUIT

**Walter H. West, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 117,335, Feb. 22, 1971, abandoned. This application Sept. 9, 1971, Ser. No. 179,117**

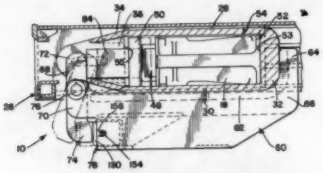
**Int. Cl. B23p *11/00***

**U.S. Cl. 29—243.52** **6 Claims**



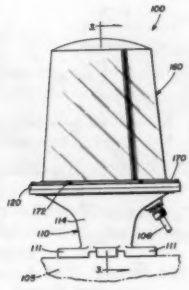
Metal pipe or conduit optionally having a thermoplastic liner is flanged by confining a pipe end and applying internal pressure from a material such as rubber to force the pipe end to form a generally radially extending flange. Both the plastic lining and the metal are sufficiently well-formed to provide satisfactory joints.

3,744,116
**DEVICE FOR REMOVING DRAFT GEAR**
Bertil E. Peterson, Chicago, Ill., assignor to Cardwell Westinghouse Company, Chicago, Ill.
Filed May 7, 1971, Ser. No. 141,150
Int. Cl. B23b *19/04*
U.S. Cl. 29—252 2 Claims



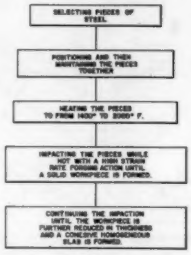
Device for removing railroad car draft gear-yoke assemblies in which the yoke is broken or cracked, wherein the device comprises a frame including a rigid elongate base having a pair of upstanding arms, one of which is rigid with the base and the other of which is swingably mounted to move its upstanding end toward the rigid arm under the action of the hydraulic ram carried by the base. After the draft gear carrier iron, coupler, and its key or keying pin are removed, the device is lifted up against the draft gear-yoke assembly, with the rigid arm positioned against the yoke inner end and the swingable arm adjacent a block of metal disposed in the yoke outer open end adjacent the draft gear front follower. The ram is then actuated to compress the draft gear between the block and yoke inner ends so as to free it from the draft gear pocket front stops, after which the draft gear and yoke may be lowered from the draft gear pocket as a unit.

3,744,117
**METHOD FOR MAKING A CURVED CUBE-CORNER REFLECTOR**
Sidney A. Heenan, Park Ridge; Norbert Majewski, Elk Grove Village, and Anthony J. Montalbano, Des Plaines, all of Ill., assignors to Amerace Esna Corporation, Union, N.J.
Filed Sept. 30, 1971, Ser. No. 185,245
Int. Cl. B23p *17/00*
U.S. Cl. 29—416 28 Claims



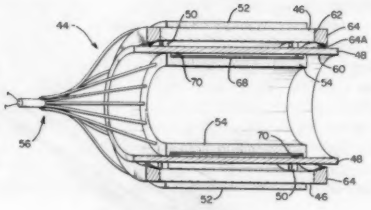
The method of making a curved cube-corner reflector includes making a substantially-flat member having a multiplicity of cube-corner elements therein, and then bending the body against a form having a substantially-smooth curved surface so that the reflector assumes the shape of the curved surface.

3,744,118
**SOLID STATE METHOD FOR CONSOLIDATING SMALL PIECES OF METAL INTO A WORKPIECE**
Mark E. Whalen, Pepper Pike; Norman W. Trepanier, Rocky River, and Robert A. Kraus, Shaker Heights, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio
Filed Mar. 8, 1971, Ser. No. 121,861
Int. Cl. B23q *17/00*
U.S. Cl. 29—403 36 Claims


SELECTING PIECES OF STEEL
POSITIONING AND THEN MAINTAINING THE PIECES TOGETHER
HEATING THE PIECES TO FROM 1400° TO 2000° F.
IMPACTING THE PIECES WHILE HOT WITH A HIGH STRAIN RATE FORGING ACTION UNTIL A SOLID WORKPIECE IS FORMED.
CONTINUING THE IMPACTION UNTIL THE WORKPIECE IS FURTHER REDUCED IN THICKNESS AND A COHESIVE HOMOGENEOUS SLAB IS FORMED.

A method is disclosed of converting scrap or other random sized small pieces of steel into a useful, commercial product while maintaining the steel in a solid state. The pieces are baled and compacted until the bale is from 20 percent to 40 percent solid, and thereafter further compacted until the bale becomes solid and substantially free of voids. The bale is then heated and compressed until the pieces are welded together into a cohesive, homogeneous slab. Prior to the completion of bale compression the bale is heated to from 1,200° to 2,350° F. The bale compression is preferably effected by repeated impaction in a harmonic press employing a pair of opposed, oppositely acting platens impacting opposed outer surfaces of the bale.

3,744,119
**METHOD FOR EXPLOSIVELY BONDING TOGETHER METAL LAYERS AND TUBES**
Ivor G. Hanson, 7530 Teller St.; George Herbst, 6777 Vivian St., both of Arvada, Colo., and Jerry M. Lewis, 721 Mead St., Louisville, Colo.
Filed Nov. 28, 1969, Ser. No. 880,822
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 12 Claims



Method and assembly for welding a flyer metal tube to a parent metal tube, comprising assembling a flyer metal tube and a parent metal tube in concentric disposition with the outer surface of one of said tubes being disposed in parallel, spaced-apart relation with the inner surface of the other metal tube, selecting and matching two layers of explosive which will, during simultaneous detonation thereof, produce a general balance of forces along the resulting detonating fronts in a direction normal to said layers of explosive and, following detonation of the layers of explosive, maintain a pressure differential between the released and expanding gases generated by the detonation of the two layers of explosive below a

predetermined amount, placing a first one of said layers of explosive about the outer surface of the outer metal tube and placing a second layer of explosive about the inner surface of the inner metal tube, and simultaneously detonating said layers of explosive along a common, generally planar front so that the detonation is propagated parallel to the longitudinal axis of said tubes. The loading of the layer of explosive disposed about a surface of the flyer metal layer is sufficient to produce a pressure greater than the elastic limit of the metal tube in the assembly having the higher elastic limit and to effect bonding between the metal tubes. The loading of the layer of explosive disposed about a surface of the parent metal tube is sufficient to preclude movement of the parent metal tube relative to the flyer metal layer in a manner that would prevent welding together of said metal tubes. The method and assembly relate to the use of a flyer metal tube having a resistance factor of at least approximately $1.5(10)^{-4}$ psi and which is spaced apart from the parent metal layer by a distance equaling at least approximately 0.05 times the thickness of the flyer metal layer, and also to the use of a flyer metal tube having a resistance factor of at least approximately $2.5(10)^{-4}$psi and which is spaced apart from the parent metal tube by a distance equaling at least approximately 0.1 times the thickness of the flyer metal tube. The method and assembly also relate to the welding together of metal layers sandwiched between two layers of explosive in which the flyer metal layer has a resistance factor of at least approximately $2.5(10)^{-4}$ psi and the distance separating said metal layers, prior to bonding, equals at least approximately 0.1 times the thickness of the flyer metal layer. The article of manufacture produced comprises a flyer metal layer bonded to a parent metal layer in which the flyer metal layer, prior to bonding, has a resistance factor of at least approximately $2.25(10)^{-4}$psi, and also a flyer metal tube bonded to a parent metal tube in which the flyer metal tube, prior to bonding, has a resistance factor of at least approximately $2.5(10)^{-4}$psi.

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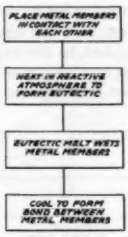
**3,744,120**

## DIRECT BONDING OF METALS WITH A METAL-GAS EUTECTIC

**James F. Burgess, and Constantine A. Neugebauer, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 20, 1972, Ser. No. 245,890**
**Int. Cl. B23k** *31/02, 35/38*
**U.S. Cl. 29—494** **6 Claims**


PLACE METAL MEMBERS IN CONTACT WITH EACH OTHER
HEAT IN REACTIVE ATMOSPHERE TO FORM EUTECTIC
EUTECTIC MELT WETS METAL MEMBERS
COOL TO FORM BOND BETWEEN METAL MEMBERS

A method is described for direct bonding of metallic members to other metallic members with a metal-gas eutectic. The method comprises placing a metal member such as copper, for example, in contact with another metal member, such as nickel, for example, heating the metal members to a temperature slightly below the melting point of the lower melting point metal, e.g., approximately 1,072°C. for copper, the heating being performed in a reactive atmosphere, such as an oxidizing atmosphere, for a sufficient time to create a metal-gas eutectic melt which, upon cooling, bonds the metal members together. Various metals and reactive gases are described for direct bonding.

**3,744,121**

## PROCESS FOR SOLDERING DIFFICULTLY SOLDERABLE METALS, SUCH AS SI, GE, AL, TI, ZR AND TA

**Kentaro Nagano; Koyji Nomaki, and Yoshihito Saoyama, all of Yokohama, Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan**

**Filed Nov. 19, 1970, Ser. No. 91,208**
**Claims priority, application Japan, Aug. 15, 1970, 45/71487**
**Int. Cl. B23k** *35/12*
**U.S. Cl. 29—502** **8 Claims**

Difficulty solderable metals, such as Si, Ge, Al, Ti, Zr and Ta are soldered using a solder alloy composed of 40 – 98 wt. % Pb, 1.8 – 50 wt. % Sn, 0.05 – 10 wt. % Zn and 0.05 – 10 wt. % Sb, while applying vibration, preferably ultrasonic vibration.

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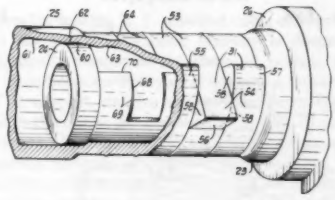
**3,744,122**

## METHOD OF FORMING STAKED SEAL FOR TUBULAR PARTS

**Ralph G. Ridenour, and Walter Chandler Stevens, Jr., both of Mansfield, Ohio, assignors to Universal Refrigeration, Inc., Mansfield, Ohio**

**Filed Mar. 11, 1971, Ser. No. 123,255**
**Int. Cl. B21d** *39/00*; **B21p** *11/00*
**U.S. Cl. 29—516** **15 Claims**




A pair of mating dies is disclosed to establish a compression staked surface on the outer malleable wall of inner and outer telescoped tubular parts with the compression staked surface having a radially compressed area and a toothed area and establishing a zig-zag seal path between the inner and outer tubular parts which is fluid pressure tight and also resists longitudinal and torsional force between the parts. The foregoing abstract is merely a resume of one general application, is not a complte discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

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**3,744,123**

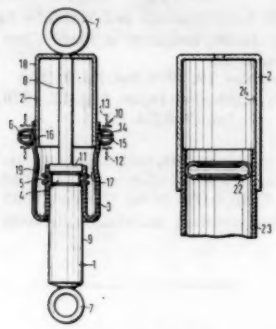
## METHOD OF ASSEMBLING A RESILIENT TUBE WITH A RIGID BODY

**Rudi Vers, Heidenfeld, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany**

**Filed May 11, 1971, Ser. No. 142,130**
**Claims priority, application Germany, May 14, 1970, P 20 23 579.4**
**Int. Cl. B21d** *39/00*; **B23p** *11/00*
**U.S. Cl. 29—520** **5 Claims**

Resilient bellows sealingly connect a protective cup on the piston rod of a telescopic shock absorber to the cylinder of the

shock absorber. The bellows are secured to the cup and the cylinder by fastening rings. Each ring is an annular channel



whose web holds the bellows against the cup or the cylinder under a pressure produced by axially compressing the flanges.

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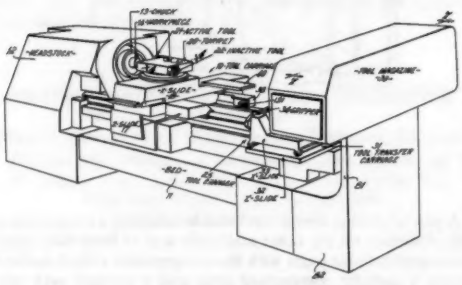
**3,744,124**

## MACHINE TOOL RETRIEVAL AND INTERCHANGE SYSTEM

**Louis T. Gardner, Cincinnati, Ohio, assignor to Le Blond Incorporated, Cincinnati, Ohio**

**Filed Sept. 12, 1969, Ser. No. 857,531**
**Int. Cl. B23q *3/155***
**U.S. Cl. 29—568** **12 Claims**



A machine tool including, a rotatable turret having oppositely disposed tool holders for alternatively positioning one of the tool holders in an active or cutting position relative to a workpiece and the other of the tool holders in an inactive or idle position, a magazine having a plurality of tool holding devices successively movable past a tool interchange station, tool transfer means for transferring tools between the magazine and the inactive turret tool holder, and means for retrieving a desired tool from the magazine. The retrieving means includes a stationary memory bank mounted independent of the magazine tool holding devices. The memory bank has a memory element allocated to each of the magazine tool holding devices which is susceptive of storing the arbitrary identifier of a tool positioned in the magazine tool holder to which it is allocated, and an accessing circuit for successively accessing the magazine tool holder memory elements as the tool holders to which they are respectively allocated successively move past the interchange station. A comparison circuit successively compares the identifiers stored in the successively accessed memory elements with the identifier of a desired tool, producing an output when the identifier of the desired tool is located at the interchange station. The contents of the memory elements allocated to the magazine tool storage devices, as well as certain additional memroy elements allocated to the turret tool holders, are updated when a tool is transferred between the magazine and the inactive turret tool holder or between the active and inactive turret tool holders.

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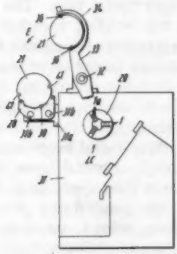
**3,744,125**

## LATHE CHUCK WITH EXCHANGEABLE JAWS AND JAW CHANGING MEANS THEREFOR

**Erhard Schalles, Ubbedissen, Germany, assignor to Werkzeugmaschinenfabrik Gildemeister Comp. and Aktiengesellschaft, Bielefeld, Germany**

**Filed Jan. 31, 1972, Ser. No. 221,605**
**Claims priority, application Germany, Feb. 3, 1971, P 21 04 904.7**
**Int. Cl. B23q *3/157*; B23b *7/00***
**U.S. Cl. 29—568** **26 Claims**



A program-operated machine tool wherein the housing of a rotary lathe chuck carries three radially movable holders for detachable work-engaging jaws. The jaws can be withdrawn axially of the housing in first positions of the holders and are automatically locked to the holders when the holders are moved to second positions. A shiftable magazine on the frame of the machine tool contains a set of pallets at least some of which support groups of differently dimensioned jaws. A transfer device on the frame is movable between several positions to withdraw an empty pallet from the magazine, to move such pallet into alignment with the chuck housing for reception of jaws from the holders, to thereupon move a pallet with a group of different jaws into alignment with the chuck housing, and to place the jaws thereon into optimum positions for locking to the holders.

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**3,744,126**

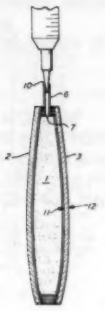
## METHOD FOR CONTROLLING BOWING IN LIGHT VALVES

**Matthew Forlini, Ozone Park, and Francis C. Lowell, Huntington Station, both of N.Y., assignors to Research Frontiers Incorporated, Plainview, N.Y.**

**Filed July 26, 1971, Ser. No. 166,014**
**Int. Cl. H01s *4/00***
**U.S. Cl. 29—592** **25 Claims**

A method is disclosed for controlling the bowing of the walls of light valves. This is especially necessary when large sized valves contain a liquid suspension. To reduce this distortion of shape and thereby eliminate bowing, an amount of fluid is withdrawn from the cell prior to sealing the cell hermetically. Fluid is withdrawn, thereby reducing the pressure

on the inside of the walls, until the pressure at least one point inside the walls, and preferably toward the lower center of a



light valve positioned vertically, is substantially equal to the atmospheric pressure on the outside of the light valve walls.

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**3,744,127**

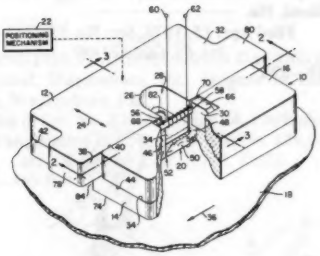
**METHOD OF MAKING MAGNETIC HEAD ASSEMBLY**

**Dwight W. Brede, Los Altos Hills; Miles H. Cook, San Jose; Marshall E. Freeman, San Jose, and Harold L. Turk, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 794,322, Jan. 27, 1969, Pat. No. 3,610,837. This application Mar. 8, 1971, Ser. No. 122,193**

**Int. Cl. G11b *5/42*; H01f *7/06***

**U.S. Cl. 29—603** **5 Claims**




A method for making an air bearing slider assembly which includes a magnetic head and a body comprising a plurality of elements assembled together such that a recess and a slot are formed. The method includes forming the elements individually, finishing magnetic head supporting surfaces on one of the elements, bonding the plurality of elements together to form the body having a recess and a slot therein, positioning the magnetic head with its associated legs supported on the supporting surfaces and with its gap positioned in the slot, filling the slot with a glass that surrounds and wets the magnetic head, and cooling the glass.

**3,744,128**

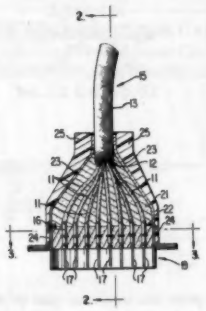
**PROCESS FOR MAKING R. F. SHIELDED CABLE CONNECTOR ASSEMBLIES AND THE PRODUCTS FORMED THEREBY**

**Aaron Fisher, and Carroll H. Clatterbuck, both of Silver Spring, Md., assignors to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Feb. 12, 1971, Ser. No. 114,873**

**Int. Cl. H02g *15/00***

**U.S. Cl. 29—629** **7 Claims**



A process for making R. F. shielded cable connector assemblies and the products formed thereby is described. The process basically comprises the steps of: potting wires of a shielded cable between the cable shield and a connector housing to fill in, support, rigidize and insulate the individual wires contained in the cable; coating the thusly formed potting with an electrically conductive material so as to form an entirely encompassing adhering conductive path between the cable shield and the metallic connector housing; and, forming a protective jacket over the conductive coating between the cable shield and the connector housing.

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**3,744,129**

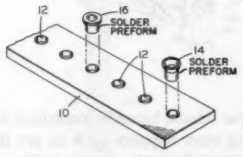
**METHOD OF FORMING A BUS BAR**

**Daniel Dewey, Jr., Essex, Conn., assignor to Rogers Corporation, Rogers, Conn.**

**Filed Feb. 9, 1972, Ser. No. 224,774**

**Int. Cl. H02g *15/08***

**U.S. Cl. 29—624** **1 Claim**

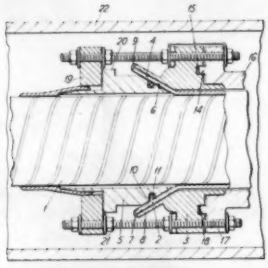



A bus bar is presented having a plurality of apertures therethrough with solder preforms retained in the apertures, the bus bar being particularly suited for mating with a multipin connector.

## 3,744,130
## METHODS OF JOINTING METAL PIPES AND OTHER METAL TUBULAR BODIES

Michael Savvas Papadopulos, Longfield, Kent, and Peter Guilford, Erith, Kent, both of England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Apr. 23, 1971, Ser. No. 136,817
Claims priority, application Great Britain, Apr. 24, 1970, 19,839/70
Int. Cl. H01r 43/00
U.S. Cl. 29—628 23 Claims

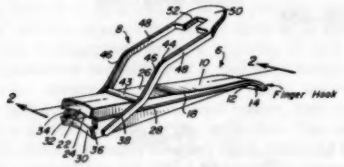


A fluid-tight joint between an end of a metal cable sheath and another metal body having a throughbore, for instance another metal cable sheath or a metal joint enclosure, is effected by shaping a length of the sheath adjacent the end in such a way that the extreme end of the sheath is radially spaced from the cable core. The metal body is arranged to embrace the shaped length and a second metal body is arranged to engage the inner surface of the shaped length in such a way that the extreme end of the sheath is exposed and lies close to an adjacent part of the first or each metal body. Molten metal is applied over the extreme end of the sheath and over said adjacent part of the first or each metal body, e.g. by welding, to form an adherent body of the metal. Preferably the area of the adjacent part of the first or each metal body is equal to the cross-sectional area of the extreme end of the sheath.

## 3,744,131
## NAIL CLIPPER WITH RECEIVER FOR NAIL CLIPPINGS

Libero G. Manes, 87041 Acri, Italy

Filed Oct. 14, 1970, Ser. No. 80,596
Int. Cl. A45d 29/02
U.S. Cl. 30—28 6 Claims

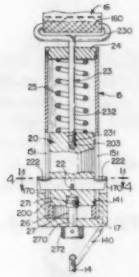



A nail clipper which, broadly construed, is comparable with dual leg spring steel clippers such as are in widespread use. One improvement features a self-contained hollow receiver which traps and temporarily stores several nail clippings but permits emptying and disposition with requisite nicety. Another improvement has to do with the nipping jaws wherein each jaw has a main or primary cutting blade whose respective ends are equipped with right-angled auxiliary cutting blades. A pivoted fold-away yoke serves as a force applying jaw-closing lever.

## 3,744,132
## PURSE THEFT PROTECTION DEVICE

Paul V. Korth, 19213 Yonka, Detroit, Mich.

Filed Apr. 19, 1972, Ser. No. 245,598
Int. Cl. A45c 13/24; G08b 15/00
U.S. Cl. 30—152 4 Claims

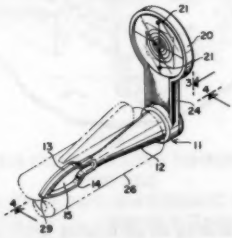


A purse theft protection device for causing a purse snatcher to release his grip on one of a pair of cylindrical ostensibly ornamental spacer elements connected in longitudinal spaced relathionship at their lower end to the upper frame of the purse and at their upper end to one end of the purse handle, leaving a sufficient distance between the upper purse frame and the ends of the purse handle to permit the purse to be firmly gripped by its handle for carrying the same in a conventional manner. Each said cylindrical ornamental spacer element incorporating a plurality of circumferentially spaced concealed radially disposed knife blades at the lower end portion thereof which become exposed and travel upwardly along slots provided in said cylindrical spacer element and cut the hand or fingers of a purse snatcher who may attempt to snatch the purse by manually gripping either of said ornamental cylindrical spacer elements and attempting to jerk the purse from the hand of a lady carrying said purse by its handle in a conventional manner.

## 3,744,133
## COLLIMATING DEVICE FOR TELESCOPIC SIGHTS

Susumu Fukushima, Itabashi-ku, Tokyo, Japan, and Willard H. Korte, North Miami Beach, Fla., assignors to Tasco Sales, Inc., Miami, Fla.

Filed Apr. 15, 1971, Ser. No. 134,241
Int. Cl. G01c 21/00
U.S. Cl. 33—234 8 Claims



A collinating device for telescopic sights utilized in connection with a firearm is shown which includes a bore supported member and an upstanding member upon which sighting indicia are disposed. The sighting indicia preferably are in the form of a grid pattern disposed upon a film member. The bore supported member is formed with a tapered stem portion and a plurality of compressible oppositely laterally extending ele-

ments which are carried by the rear of the stem portion. The stem portion is tapered and includes the dimensions of 0.17 inches to 0.45 inches so that it can be accommodated within the bore of the generally utilized calibers of firearms. The sighting member is formed with a lower stem portion and an upper dished circular portion provided with an opening therewithin. The film member bearing sighting indicia is disposed across the opening.

A method of utilizing the device of this invention is also shown.

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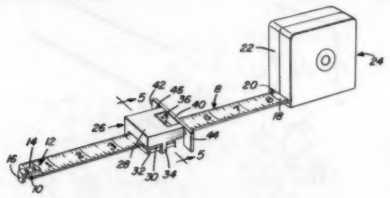
**3,744,134**
**METAL TAPE ABUTMENT SLIDE**
**Joseph J. Zima, Jr., 6729 W. 174th Place, Tinley, Ill.**
**Filed July 20, 1972, Ser. No. 273,632**
**Int. Cl. G01b *3/10***
**U.S. Cl. 33—138** **6 Claims**



A block-like or an equivalent slide is shiftably mounted on the graduated tape of a conventional-type extensible and retractable measuring tape. The slide is provided with an appropriate groove to accommodate the tape. The body portion of the slide has a bendably resilient bottom portion which can be manually squeezed and held by a retaining latch which is readily applicable and releasable and which functions to localize and hold the slide in a set measurement indicating position. One marginal edge of the slide is provided with a limit stop abutment which when brought into contact with a measurable surface serves to ascertain and temporarily mark the distance of a second surface from a first surface. The abutment plate is adjustably mounted and a centralized lower edge portion is provided with a clearance notch for the tape. The over-all device functions for measuring distances between either inside or outside surfaces.

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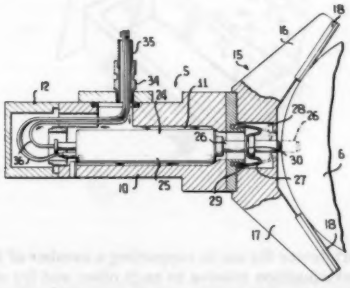
**3,744,135**
**GAS SPRING FOR TRANSDUCER ON GAGING DEVICE**
**Kurt M. Gebel, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.**
**Continuation of Ser. No. 824,433, May 14, 1969, abandoned.**
**This application Sept. 8, 1971, Ser. No. 178,807**
**Int. Cl. G01b *13/08, 13/16, 13/22***
**U.S. Cl. 33—169 R** **8 Claims**



This disclosure relates to work gaging devices for machine tools in which gas under pressure maintains a sensing member in contact with a workpiece. It also includes a container for the gas having a volume substantially greater than the displacement of the sensing member of the gage so that gas pressure is not affected by movement of the sensing member. The container serves as a junction box for electrical components such as a gage signal amplifier and conductors, as well as the gas. The connection between the junction box and the gaging device is a single conduit for both the electrical conductors and the gas. In order to prevent escape of gas through the electrical conductors and conduits connecting the junction box and an associated machine control panel, the electrical conduits, at this point, include gas-tight plug connections.

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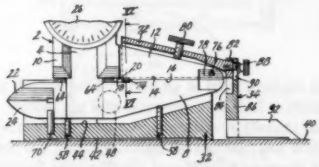
**3,744,136**
**CONVERTER ACCESSORY FOR CALIPERS**
**John R. Henke, 701 S. Shore Drive, Kansas City, Mo.**
**Filed Oct. 7, 1971, Ser. No. 187,288**
**Int. Cl. G01b *5/02***
**U.S. Cl. 33—169 R** **2 Claims**



An accessory for converting an ordinary pair of vernier or dial calipers into a vertical height measuring instrument, consisting of a block supportable on any flat surface and having a slot formed in the upper surface thereof for receiving the fixed jaw of a pair of calipers therein whereby the beam of the calipers extends vertically upwardly and disposes the movable jaw of the calipers above said block, and an extension jaw attachable to said movable caliper jaw, said extension jaw being horizontally offset from said block and spaced below said movable caliper jaw by a distance equal to the height said fixed jaw is held above said flat surface by said block.

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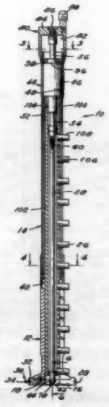
**3,744,137**
**HEIGHT GAUGE**
**Nicholas M. Milan, 21664 New Castle, Harper Woods, Mich.**
**Filed Apr. 28, 1971, Ser. No. 138,090**
**Int. Cl. G03b *1/64***
**U.S. Cl. 33—170** **7 Claims**



The height gauge includes an upstanding tubular housing in which is mounted a screw/nut type micrometer. The screw of

the micrometer is connected to the base of the housing to prevent vertical travel of the screw whereby the micrometer nut mechanism will travel vertically. The micrometer nut mechanism is connected to a tubular gauge member which is received within the housing. The tubular gauge member includes gauge pins which extend exteriorly of the housing to accomplish the measuring function of the gauge. The tubular gauge member is spaced from the major portion of the interior surface of the housing to provide thermal insulation therebetween and thereby prevent the gauging parts being subjected to ambient temperature changes resulting from handling of the gauge mechanism during use.

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**3,744,138**

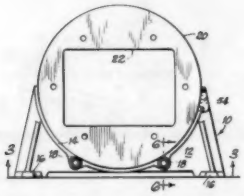
**ROTARY LAYOUT STAND**

**Leo H. Schuler, 327 West Valerian Drive, Decatur, Ill.**

**Filed Nov. 15, 1971, Ser. No. 198,655**

**Int. Cl. G01b** *5/00*

**U.S. Cl. 33—174 TA** **6 Claims**



A rotary layout stand for use in pattern making formed by a base having two rollers mounted thereon and a substantially vertical circular panel mounted on the rollers of the base for rotation thereon, with the circular panel having a central opening adapted to have a match plate fixed thereon and having releasable means adapted to prevent rotation of the circular panel on the rollers.

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**3,744,139**

**APPARATUS FOR MEASURING OF TEST PIECES**

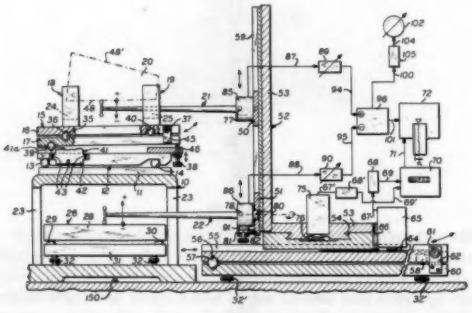
**Wilhelm Bibl, Braunschweig, Germany, assignor to Wenczler & Heidenhain, Traunreut near Traunstein, Germany**

**Filed June 10, 1968, Ser. No. 735,735**

**Claims priority, application Germany, June 8, 1967, W 44133**

**Int. Cl. G01b** *5/20*

**U.S. Cl. 33—174 P** **6 Claims**



An apparatus for measuring of form-, position- and measure- deviations on test pieces and the like by means of a sensing system, which is displaceable relative to said test pieces, wherein the sensing system comprises two measuring tracers, one of the measuring tracers sensing the surface of the test pieces during its displacement. A reference face means is coordinated to the test pieces, and the other of the measuring tracers senses simultaneously the reference face. Means are provided for employing both measuring values delivered from the measuring tracers jointly for the determination of error values on points of the surface of the test pieces.

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**3,744,140**

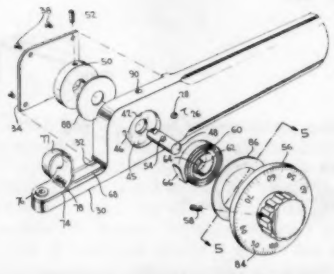
**CIRCUMFERENCE MEASURING DEVICE**

**Harry J. Kyrk, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Filed Jan. 11, 1971, Ser. No. 105,355**

**Int. Cl. G01b** *3/02, 3/10*

**U.S. Cl. 33—179** **7 Claims**



A circumference measuring device including an elongated body forming a handle grip and a housing, a rotatable drum disposed in the housing, a flexible band having one end secured to the drum and a slot in the other end thereof to permit looping of the flexible band, and a rotatable measuring dial secured to a common shaft with the drum such that movement of the drum in tightening the flexible loop around an object to be measured moves the dial to permit the obtention of a circumferential measurement.

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**3,744,141**

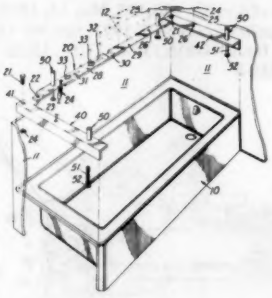
**TILE SETTERS' GAUGE**

**Frank N. Strickland, Sr., Route 2, Box 152, Highway 138-E, Stockbridge, Ga.**

**Filed Apr. 30, 1971, Ser. No. 139,043**

**Int. Cl. G01b** *3/38*

**U.S. Cl. 33—180 R** **4 Claims**



A support device for use in supporting a number of tile elements in juxtaposition relative to each other and for aligning the tile elements relative to a predetermined horizontal level line in the initiation of a tile setting operation. The support device includes a first tile supporting bar having adjustable

means for changing the effective length thereof. The first tile supporting bar includes additional tile supporting bars extending at substantially right angles from opposite ends thereof with the dimensions of the elongated tile supporting bar and the angular supporting bars detailed to extend around the upper surface of and adjacent three lateral edges of a bathtub. A number of adjustable elements are operatively connected to the tile supporting bars whereby the supporting bars can be angularly oriented relative to a predetermined horizontal level line.

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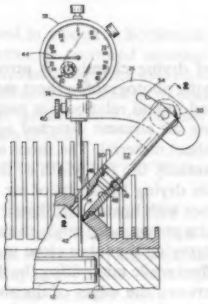
**3,744,142**

## TIMING GAGE

**George L. Marshall, Warwick, R.I., assignor to Central Tool Co., Inc., Cranston, R.I.**

**Filed Feb. 17, 1972, Ser. No. 227,086**
**Int. Cl. G01b 5/14**
**U.S. Cl. 33—181 AT** **1 Claim**



There is disclosed a timing gage in which male threads are provided to engage the threads above an internal combustion engine piston ordinarily used to accept a spark plug, and a dial gage mounting hole is provided, the parts being so related that the axis of the mounting hole is at an acute angle to the axis of the threads, and the threads are interrupted by an opening which permits passage of a dial gage plunger.

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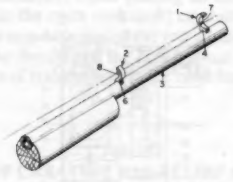
**3,744,143**

## CIRCULAR SEGMENTED SIGHTING MECHANISM

**David D. Kilpatrick, 1202 Rigel Drive, Port Hueneme, Calif.**

**Continuation of Ser. No. 767,935, Oct. 16, 1968, abandoned. This application Jan. 4, 1971, Ser. No. 103,875**
**Int. Cl. F41g 1/00, 11/00**
**U.S. Cl. 33—233** **2 Claims**



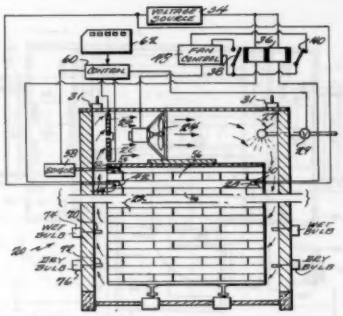
Circular segmented flanges extend radially outwardly from the gun barrel, their length and radii being such that, when longitudinally alligned one with the other and viewed, a perfect circle is seen by the viewer.

**3,744,144**

## AUTOMATED CONTROLS FOR LUMBER DRYING KILN

**Henry M. Weis, P.O. Box 391, Pensacola, Fla.**

**Filed Apr. 23, 1971, Ser. No. 136,704**
**Int. Cl. F26b 3/02**
**U.S. Cl. 34—16.5** **8 Claims**



A kiln for drying lumber having at least a single fan for circulating air within the kiln whereby a pair of probes is placed on the surface of each of two boards at different locations in the kiln and the fans reversed whenever the difference in moisture content between the two boards exceeds a predetermined amount. According to a further aspect of the invention, a pair of probes are imbedded in another board in the kiln to detect the moisture content of the interior of the board and a suitable signal generated and applied to a control mechanism which also receives a coded information carrier having a schedule of wet and dry bulb temperatures for each of a plurality of interior moisture contents. The wet and dry bulb temperatures are automatically varied by the control mechanism in accordance with the schedule and the detected interior moisture content.

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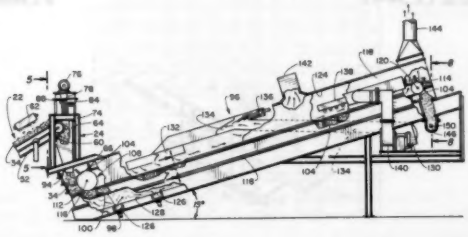
**3,744,145**

## ORGANIC WASTE DRYER APPARATUS

**Bert F. Maxwell, Santa Paula; Donald A. Price, and Harold A. Price, both of Orange, all of Calif., assignors to Julius Goldman's Egg City, Moorpark, Calif.**

**Filed Mar. 29, 1971, Ser. No. 129,077**
**Int. Cl. F27b 9/24**
**U.S. Cl. 34—68** **20 Claims**

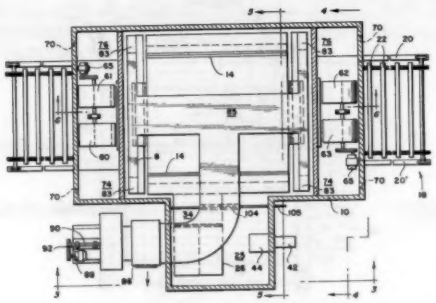


An apparatus to effect drying of organic waste wherein the waste product is metered into a thin layer within a plurality of troughs upon the bed of a primary dryer apparatus, the waste product being moved through the troughs by a staggered plow arrangement, the waste products being subjected to conductive heat and convective heat and radiative heat within the dryer apparatus upon exit from the dryer apparatus the waste product being pulverized and conducted through a vertical dryer into a cyclone separator.

## 3,744,146
## SHRINK TUNNEL

John A. Nichols, Canton, Mass., assignor to Mill Engineers, Inc., Shreveport, La.

Filed June 2, 1970, Ser. No. 42,747
Int. Cl. F26b *19/00*
U.S. Cl. 34—212 17 Claims

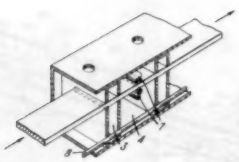


A shrink tunnel for heat shrinking plastic film about pelletized articles wherein the tunnel has continuously open ends and a conveyor for transporting the articles through the tunnel. Heated air is evenly applied to the top and sides of the film surfaces through apertured side and top walls and to the ends of the film surfaces through a first nozzle that extends across the top of the opening at each end of the tunnel and directs heated air downwardly and inwardly of the tunnel ends. A second nozzle is mounted adjacent to and outwardly from each of the first hot air nozzles and directs relatively cooler air downwardly and inwardly of the tunnel ends and preferably in a direction parallel to the heated air, to provide air curtains on both ends of the tunnel. Slots are further provided along the bottom of the side walls of the tunnel for directing heated air inwardly and downwardly against the lower portions of the palletized articles to shrink wrap the plastic around the pallet as well as the articles on the pallet.

## 3,744,147
## ARTIFICIAL SEASONING OF TIMBER

John Henry Pless, 48 Kinnerton St., London, S.W.1, England

Filed Sept. 8, 1969, Ser. No. 855,880
Claims priority, application Great Britain, Sept. 6, 1968, 42,609/68
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 6 Claims

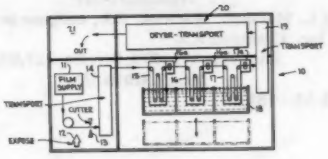


The invention relates to an improved method of preventing bowing, cupping twisting or springing of boards or planks of lumber. During the latter portion of the timber drying schedule i.e. after the lumber has reached its fibre saturation point, the boards or planks are passed between spaced pairs of rollers arranged to hold the lumber in a fixed plane. The lumber is therefore held in this plane while it is setting. Preferably the drying schedule includes intermittent exposure of the lumber to microwave radiation in an electronic kiln dryer.

## 3,744,148
## DRYING APPARATUS FOR PHOTOGRAPHIC SHEET MATERIAL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Paul Epstein, Brookline; George Donovan, Middleton, both of Mass., and Eric La White, Royalton, Vt.

Filed Nov. 12, 1971, Ser. No. 198,362
Int. Cl. F26b *13/00*
U.S. Cl. 34—160 11 Claims

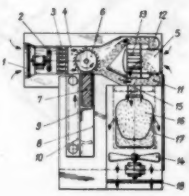


An elongated drying chamber is provided with transport means for carrying photographic sheet material edgewise with the sheets in end-to-end relationship past a plurality of tubes that issue drying air streams directed against the liquiphilic surface of the sheet material. The tubes are slotted a distance equal to substantially the full width of the sheet material for complete, gentle drying by sheets of air. A common plenum supplies the tubes with heated air; the air being directed from the tube slots at a pronounced angle to the sheet surface so as to provide for arraying the tubes close to the surface for maximum drying effect while minimizing the danger of mechanical interference between the edges of the sheets and the slots in the tubes. The drive for the transport is housed in an enclosure between the plenum and the drying chamber and is provided with access through an overlying insulating chamber; an air return duct being provided along another side to complete insulation of the drying chamber from ambient conditions. Discharge openings for release of moisture-laden air are the entrance and exit openings for the passage of said sheet material, and make-up air is drawn through a filtered inlet in the return duct.

## 3,744,149
## SUCKING FLAKE HAND DRYER

Roman A. Helbling, Fridback 1/12, 6300 Zug, Switzerland

Filed Mar. 29, 1972, Ser. No. 239,074
Claims priority, application Switzerland, May 6, 1971, 6733/71
Int. Cl. F26b *19/00*
U.S. Cl. 34—202 9 Claims

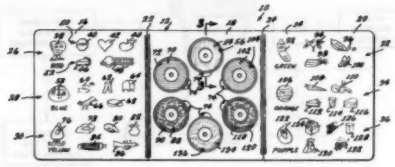


A device for drying hands by blowing heated air and flakes over the hands in a hand drying shell and drawing the flakes from the hands and shell into a waste flake sack.

## 3,744,150
## SOUND ILLUSTRATED BOOK

Henry J. Folson, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 3, 1972, Ser. No. 214,815
Int. Cl. G09b 1/06
U.S. Cl. 35—8 A 6 Claims

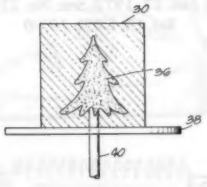


Pictures are printed in a book in horizontal rows simulating rows of printed matter. A recorded message describes each picture in a predetermined sequence corresponding to a reading pattern from left-to-right and top-to-bottom of the page for developing habit patterns in a child-user which will precondition him to learn to read.

## 3,744,151
## EDUCATIONAL TOY

John S. Meek, 14 Outrigger St., Venice, Calif., and J. Roy Nelson, 8741 Shoreham Drive, Los Angeles, Calif.

Filed May 1, 1972, Ser. No. 249,088
Int. Cl. G09b 23/16
U.S. Cl. 35—19 R 26 Claims




An educational toy comprising a closed container filled with a liquid having a freezing point generally below room temperature and a metal rod extending into the container and outwardly therefrom through a heat insulating material and into a second open container. Upon placing an ice cube about the end of the rod in the open container, crystallization is seen to occur about the opposite end of the rod within the closed container due to the freezing of the liquid about the rod, thereby giving the effect of transfering the ice cube from one container to the other.

## 3,744,152
## METHOD OF CREATING BAS-RELIEF AND MEZZO-RELIEVO ART WORKS

Sherry Knopf Crasilneck, 5635 Yolanda Circle, Dallas, Tex.

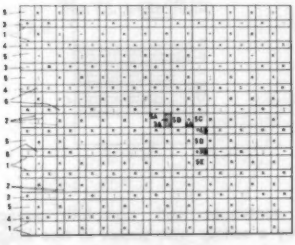
Filed Mar. 22, 1972, Ser. No. 237,186
Int. Cl. G09b 11/00; B44d 1/54
U.S. Cl. 35—26 8 Claims

A method of creating painting-sculpture of the bas-relief or mezzo-relievo type utilizing a suitable glue. The subject to be portrayed is detailed on suitable material, and selective applications of transparent or translucent drying glue are made until the desired build up of each portion of the subject is attained. Faster buildup is accomplished in portraits utilizing dots of dried glue placed to create the proper illusion of depth and then glued in place. When the desired relief has been obtained, the desired paint or other media is applied to the art work. Corrections may be made after color is applied to the art work. A suitable knife or spatula is used for smoothing thin coats of glue over facial areas to create continuity of skin textures.

## 3,744,153
## ARITHMETIC GAME

Jan Van Es, 's-Gravensingel 51, Rotterdam, Netherlands

Filed Oct. 14, 1971, Ser. No. 189,148
Claims priority, application Netherlands, Nov. 2, 1970, 7016027
Int. Cl. G09b 19/02
U.S. Cl. 35—31 F 11 Claims



Arithmetic game with game board and board pieces bearing signs or indicia which represent the ciphers or digits zero to nine inclusive and calculation operators. The players are expected to do alternately as many arithmetical operations as possible with the arithmetical implements they dispose of. To determine the score obtained in each turn, the separate ciphers or digits used for composing one or more complete arithmetical results are added. In an attractive embodiment the game's implements are enclosed in a case.

**3,744,154**

## TEACHING DEVICE

Dorothy E. Pott, Route 1, Pulaski, Wis.

Filed Feb. 24, 1972, Ser. No. 229,098
Int. Cl. G09b *1/06*
U.S. Cl. 35—35 R 8 Claims

A teaching device comprises a first or center segment having a root word inprinted thereon. One or more second end segments are pivotably attached to one end of the first segment and each segment contains a prefix for the root word. One or more third end segments are pivotably attached to the other end of the first segment and each segment contains a suffix for the root word. In use, the device is displayed so that the root word alone or in combination with any one of the prefixes or suffixes is visible. This is accomplished by moving the second and third segments individually into positions wherein the prefix or the suffix or both are properly associated with the root word. When the teaching device is not in use, the second and third segments overlap the first segment and the first segment is folded.

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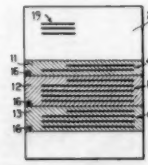
**3,744,155**

## PROCESS AND APPARATUS ESPECIALLY FOR COMMERCIAL TRANSLATIONS AND THE RESULTANT PRODUCT

George Nomine de Monet, 82 Monvilliers, Denonville, France

Filed Dec. 9, 1971, Ser. No. 206,405
Claims priority, application France, Dec. 16, 1970, 7045342
Int. Cl. G09b *19/06*
U.S. Cl. 35—35 R 4 Claims



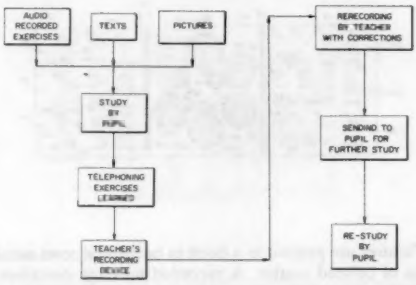
Phrases, sentences and complete paragraphs used frequently by a sender who writes in one language in corresponding with a receiver who reads a second language, are prerecorded on properly coded cards in the second language. The cards and their contents are constructed and arranged to be mounted one after the other on a supporting sheet, the composite sheet and cards therein being adapted for copying by a commercial copying device to provide a reproduction that needs only to have a date added to provide a complete commercial letter, for example. Each coded card has an identifying code designation which is reproduced in the final letter, the code deisgnation, instead of being a drawback, is a time saver for the executive who reads the letter or its counterparts before signing.

**3,744,156**

## METHODS OF TEACHING BY TELEPHONE INCLUDING USING A LANGUAGE LABORATORY

Bachir Lahlou Ottassi, 26 E. 91st St., Apt. 3D, New York, N.Y.

Filed June 14, 1971, Ser. No. 153,016
Int. Cl. G09b *5/04*
U.S. Cl. 35—35 C 4 Claims




A method of teaching which involves communicating a pupils' exercise by telephone tape recorder to a teacher, recording the pupil's exercises along with the teacher's corrections, and returning the teacher's recording to the pupil.

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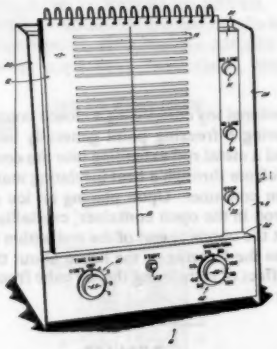
**3,744,157**

## TYPING PACER

Richard Dallas, Corvallis, Oreg., assignor to Owen Johnson, Mountain View, Calif.

Filed Jan. 27, 1972, Ser. No. 221,318
Int. Cl. G09b *19/00*
U.S. Cl. 35—35 B 18 Claims



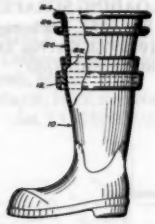
A typing pacer having visual mid-line and end-line indicators controlled by a selectively variable words-per-minute rate timer, and a visual stop indicator controlled by a selectively variable drill duration timer which also disables the rate timer. The printed pages of drill exercises each carry a vertical mid-line division.

3,744,158

## BOOT AND DETACHABLE EXTENSION THEREFOR

Frank S. Walker, 2618 Cherrywood Lane, Titusville, Fla.

Filed Oct. 21, 1971, Ser. No. 191,514
Int. Cl. A43b *3/00*
U.S. Cl. 36—1.5 11 Claims



A sportsman's boot of rubberized fabric or the like provided with a separate extension, the boot and the extension being each provided with cooperating connecting portions for attachment one to the other.

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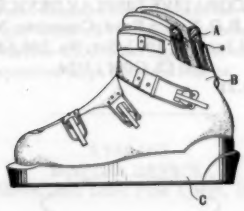
3,744,159

## SPORTS SHOE

Kazuyoshi Nishimura, No. 29, 15-ban, 4-chome, Mita, Minato-ku, Tokyo, Japan

Filed Sept. 7, 1971, Ser. No. 178,117
Claims priority, application Japan, Mar. 20, 1971, 46/15963
Int. Cl. A43b *19/00*
U.S. Cl. 36—2.5 AL 4 Claims




The present invention relates to a sports shoe characterized in that an inner layer member or an inner shoe provided with a member possessing a form corresponding to the shoe of foot is attached to the inside of the sports shoe, an air receiving cell is provided adjacent to said member, and said member is adapted to contact closely the foot under the pneumatic pressure caused by supplying air into the air receiving cell.

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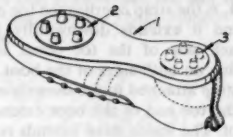
3,744,160

## FOOTWEAR

Joseph Francis Dymond, "Rosendale" Eveswell Park Road, Monmouthshire, Newport, England

Division of Ser. No. 95,519, Dec. 7, 1970, Pat. No. 3,680,231.
This application Apr. 17, 1972, Ser. No. 244,725
Claims priority, application Great Britain, Dec. 10, 1969, 60,234/69; Mar. 14, 1970, 12,395/70; July 25, 1970, 36,157/70; Argentina, Dec. 10, 1970, 232875; Japan, Dec. 10, 1970, 45/123881; Belgium, Dec. 10, 1970, 97369; Austria, Dec. 10, 1970, 11119
Int. Cl. A43b
U.S. Cl. 36—2.5 AE 2 Claims

An article of footwear has a portion on its underside that is rotatable with respect to the remainder of the article about an axis generally perpendicular to the underside thereof. A circular groove is provided on the underside of the article, extending concentrically of said axis, a rotatable component being engaged in the groove, and the rotatable portion being secured to said component.

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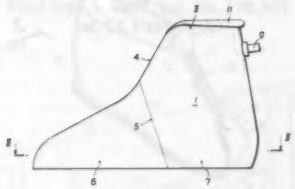
3,744,161

## SKI BOOT OR INNER SHOE FOR A SKI BOOT

Franz Herunter, Vienna, Austria, assignor to AMF Incorporated, White Plains, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,755
Claims priority, application Austria, Sept. 23, 1970, 8607
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 6 Claims




A shoe construction adaptable for use as a ski boot or as an inner shoe for a ski boot. The shoe has in its forward portion ahead of the position of the arch of the foot a preformed cushioning. The rear portion of the shoe includes a lining attached to the shoe to define a hollow space between the lining and the confines of the shoe. With the wearer's foot positioned within the shoe and oriented by the preformed cushioning, the hollow space is filled with a foamable material which assumes the contours of the foot and ankle as the foam sets.

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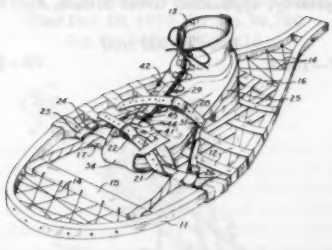
3,744,162

## SNOWSHOE BINDING

Bruce D. Beck, P.O. Box 3061, South Berkeley, Calif.

Filed Aug. 23, 1971, Ser. No. 173,833
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AB 6 Claims



A binding or harness for securing a boot to the webbing of a snowshoe. The binding includes a wide toe panel and several straps, all comprised of a pliable material such as leather, neoprene-nylon compositions, fabrics, and laminated or layered sheet material. The toe piece or panel has one end secured to the webbing of the snowshoe so as to lie beneath the boot, and it extends forwardly to and upwardly over the

toe of the boot. The toe panel provides stability by preventing the boot from sliding forwardly along the snowshoe, and it also prevents snow from accumulating under, over, and around the front of the boot. A toe strap overlies the toe panel and the toe of the boot, and it extends downwardly through slits or openings on each side of the toe panel to attach to the snowshoe webbing on both sides of the boot. An inside strap and an outside strap attached to the showshoe webbing on opposite sides of the toe end of the boot extend rearwardly on each side thereof. The inside strap extends rearwardly to and around the heel of the boot and buckles to the outside strap. An arch strap encircles the boot at an intermediate position between the heel and the toe and holds the inside and outside straps snugly against the sides of the boot. A tie strap connects between the toe panel and the arch strap to hold the top part of the toe panel rearwardly in a proper position.

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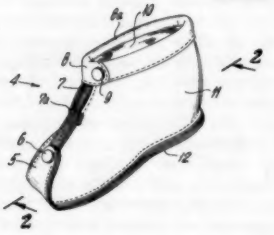
**3,744,163**
**BABY EXPANSION-SLIPPER**
**Louis W. Simister, 2500 Johnson Avenue, Riverdale, N.Y.**
**Filed July 3, 1972, Ser. No. 268,653**
**Int. Cl. A43b**
**U.S. Cl. 36—2.5 B** **7 Claims**



An open-toed slipper having a sole extension with a snap at an end thereof, the sole extension being backwardly flexible over the open toe and attachable to a free end of an elastic gore which at an opposite end of the gore is mounted on the top of the shoe, thereby providing for non-cramping shoes or slippers for babies or young children just beginning to or having just begun to walk, and the edges of the slipper including exposed foam rubber non-slidably grippable on slick or waxed floors reducing the possibility of accidental falling by the child.

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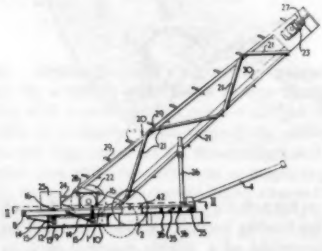
**3,744,164**
**TRANSPORTABLE CONVEYOR FOR CLEARING SURFACES**
**John L. Harrison, Birmingham, England, assignor to Dunlop Holdings Limited, London, England**
**Filed Apr. 12, 1971, Ser. No. 133,159**
**Claims priority, application Great Britain, Apr. 17, 1970, 18,363/70**
**Int. Cl. E02f 5/00**
**U.S. Cl. 37—108 R** **10 Claims**



A towable device for clearing surfaces of mud and the like including a collector means, a pickup zone and a transporter means, extending from the pickup zone. A floor member is provided in the pickup zone onto which the collector means spills the material being collected. Blades are provided in part of the collector means for chanelling the material inwardly and then outwardly prior to meeting the collector means.

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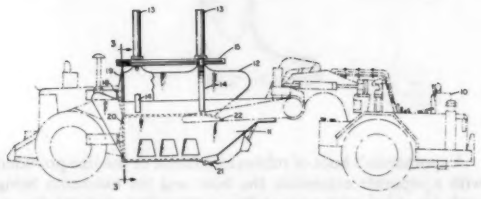
**3,744,165**
**SELF LOADING SCRAPERS**
**Michael E. Vickaryous, Box 1457, Anchorage, Ala.**
**Filed Feb. 10, 1972, Ser. No. 180,657**
**Int. Cl. E02f 5/00**
**U.S. Cl. 37—127** **1 Claim**



A double engine self loading motor scraper. A motor scraper provided with an inner bowl placed inside the main scraper bowl and suspended by hydraulic rams connected to overhead support members which are secured to the sides of the main scraper bowl. The inner bowl is loaded first and elevated vertically. The main bowl is then loaded. Approximately one-half the net scraper load is carried in each bowl. Each bowl is provided with a movable hydraulic ejecter plate for unloading the material.

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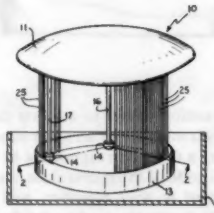
**3,744,166**
**DECORATIVE DISPLAY DEVICE**
**Russell A. Rielle, R.D. Nelson Road, Canastota, N.Y.**
**Filed June 27, 1972, Ser. No. 266,626**
**Int. Cl. G09f 13/24**
**U.S. Cl. 40—106.21** **3 Claims**



A display device is arranged for the continuous passage of slow-falling droplets of viscous liquid alternating with bubbles of air, down a plurality of transparent tubes from an upper reservoir to a lower reservoir. A pump is arranged to continuously pump liquid from the lower reservoir to the upper reservoir and an overflow conduit from the upper reservoir to the lower reservoir is arranged to maintain a constant level of liquid in the upper reservoir. The transparent tubes have their upper ends in sealed engagement with the upper reservoir and their upper end openings immersed in the liquid. A shorter intermediate tube with a plurality of apertures therethrough is loosely contained in the upper end of each transparent tube and immersed in the liquid and a third tube apertured at its lower end is loosely contained in each intermediate tube, the upper end of each third tube being exposed to atmosphere

above the level of the fluid. Fluid flows slowly down between the tubes and entraps bubbles of air drawn down the smaller third tube between droplets of fluid. Colored lights may be directed on the transparent tubes which may be of a variety of colors.

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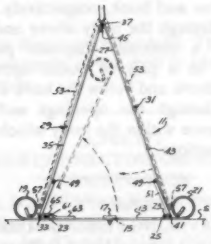
**3,744,167**
**COLLAPSIBLE SIGN DISPLAY STAND**

**Robert J. Slavsky, Lathrup Village, Mich., assignor to Shaw Slavsky, Inc., Detroit, Mich.**

**Filed May 8, 1972, Ser. No. 251,143**
**Int. Cl. G09f *01/10***
**U.S. Cl. 40—125 H** **3 Claims**



A sign display stand having an open framework which includes a base, a U-shaped rear wire frame at its base pivoted to said base and at its free ends mounting a support plate adapted to receive the apex of an inverted V-shaped sign. A hollow wire U-shaped front frame at its free ends is pivoted to said sign support plate and at its base bears against said display stand base. Reverse turned stops adjacent the ends of the base plates on opposite sides of the base retainingly engage said frames so that the free ends of the sign are retainingly disposed between the respective stops and said frames.

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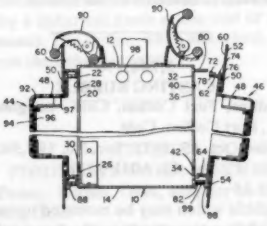
**3,744,168**
**DISPLAY DEVICE**

**Lawrence C. Howe, 412 Lone Pine Court, Bloomfield Hills, Mich.**

**Filed Dec. 20, 1971, Ser. No. 209,688**
**Int. Cl. G09f *13/04***
**U.S. Cl. 40—132 R** **2 Claims**



A display device comprising a casing having a hinged door on each side. Each door has a frame member adapted to close against the face of the casing. An outer frame member on the casing overlaps the frame member on the door. The door frame member has two water-diverting channels for directing water away from the seal.

**3,744,169**
**FLINTLOCK MECHANISM**

**Frank W. Straight, 4326-1206h St. S.E., Bellevue, Wash.**

**Filed Dec. 1, 1971, Ser. No. 203,700**
**Int. Cl. F41c *27/00, 19/00***
**U.S. Cl. 42—69 R** **5 Claims**

The action of a flintlock mechanism for firing rifles and the like is materially benefitted by the incorporation of an aluminum oxide, self-knapping ceramic flint.

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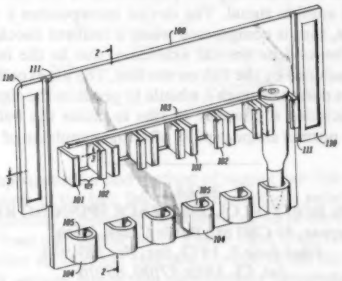
**3,744,170**
**GUN CARTRIDGE HOLDER**

**Arne A. Jensen, Franklin Park, Ill., assignor to Roger A. Hollister, Aurora, Kane County, Ill., a part interest**

**Filed Sept. 9, 1971, Ser. No. 178,947**
**Int. Cl. F42b *39/00***
**U.S. Cl. 42—87** **5 Claims**



A gun cartridge holder injection molded of thermal plastic material and adapted to hold cartridges of a variety of shapes and sizes. Cartridges are held in place by pairs of oppositely facing L shaped members and by end holding means which receive the projectile end of the cartridges. Means for attaching the holder to a belt or a gun sling are integrally formed with the holder.

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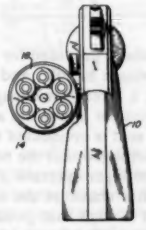
**3,744,171**
**CARTRIDGE CLIP**

**Robert E. Fecke, 2478 Aragon Avenue, Dayton, Ohio**

**Filed Dec. 10, 1970, Ser. No. 96,700**
**Int. Cl. F42b *39/04, 5/26***
**U.S. Cl. 42—89** **7 Claims**



An improvement facilitating the loading and unloading of firearms, including a clip adapted to hold a plurality of car-

tridges for unison loading of the cartridge chambers of a revolver cylinder or the like, and unison unloading. The clip is constructed for interior mounting of the cartridges, achieving thereby strength and simplified cartridge installation. One face is recessed for a flush mounting of the base of each cartridge applied. One aspect of the invention provides a cartridge so formed that cooperative parts on the clip and cartridge enable a simple interlock between the clip and supported cartridges.

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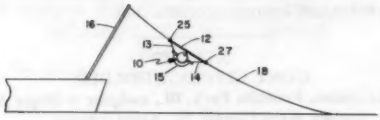
**3,744,172**
**FISH-ON-LINE SIGNALING DEVICE**
**John W. Kelli, 1560 Trellis Lane, Escondido, Calif.**
**Filed Mar. 30, 1972, Ser. No. 239,540**
**Int. Cl. A01k** *93/00, 97/12*
**U.S. Cl. 43—17** **9 Claims**




A device for indicating the presence of a fish on a fishing line by an audible signal. The device incorporates a resilient air bellows, that is compressed when a resilient shock cord is stretched beyond its normal extension, due to the increased tension produced by the fish on the line. The air expelled from the bellows passes through a whistle to produce the signal. The bellows includes a plurality of ribs to cause the bellows to resume its normal shape rapidly after the expulsion of air.

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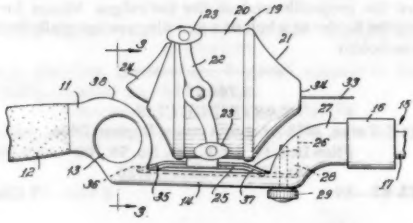
**3,744,173**
**FISHING ROD FOR CLOSED FACE SPINNING REELS**
**Mark J. Puyear, 46 Cliff St., Battle Creek, Mich.**
**Filed June 5, 1972, Ser. No. 259,931**
**Int. Cl. A01k** *87/00, 87/06*
**U.S. Cl. 43—23** **8 Claims**




A fishing rod particularly provided for use with closed face spinning reels comprising a handle, and a body member attached thereto having a forefinger-engaging aperture, and a surface on the body member above the aperture for supporting the thumb. A reel seat is connected to the bottom of the body member and so arranged that the reel seat is below substantially the entire forefinger aperture. A flexible rod is conventionally mounted in a chuck at the other end of the reel seat. The arrangement is such that positive retention of the rod during casting is provided by the forefinger, and additionally the thumb is maintained and supported in an upper position adapted for readily engaging the push button of the spinning reel.

**3,744,174**
**FISH LURE**
**Robert N. Lund, 6006 Darramoor Road, Birmingham, Mich.**
**Division of Ser. No. 754,390, Aug. 21, 1968, Pat. No. 3,590,513. This application July 8, 1970, Ser. No. 55,066**
**Int. Cl. A01k** *85/00*
**U.S. Cl. 43—42.06** **3 Claims**

A fish lure comprising a solid elongated body having eyes at both ends for a line and hook, respectively. A pair of inlet openings extend through the body above and below the line attaching eye to a centrally disposed passageway. The passageway leads to a pair of outlet openings extending through the body above and below the hook attaching eye. As water is drawn through the openings and passageway it produces a turbulence within the body which causes the lure to gyrate, in all directions.

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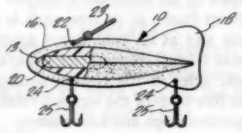
**3,744,175**
**TRAVELING FISHING LURE**
**Lester R. Bellah, 11821 Otsego, North Hollywood, and William H. Bellah, 4118 Beethoven, Los Angeles, both of Calif.**
**Filed Feb. 19, 1971, Ser. No. 116,899**
**Int. Cl. A01k** *85/00*
**U.S. Cl. 43—42.39** **3 Claims**




The invention relates to a fishing lure having a planing surface and a particular weight distribution associated with the fishing line attachment, the lure having a slightly negative buoyancy. In both embodiments shown herein, the lure normally tends to sink slowly in the water but when the line is jerked sharply, the lure makes a steep ascent in a curved path toward the surface of the water so that when the line is released and allowed to play out, the lure will continue its curved path due to its momentum and will travel away from the fisherman to a distance beyond the initial position from which it was moved to cause its initial motion.

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**3,744,176**
**CASTING BUBBLE**
**John M. Bondhus, Fort Collins, Colo., assignor to Rainbow Plastics Inc., Fort Collins, Colo.**
**Filed Oct. 15, 1971, Ser. No. 189,565**
**Int. Cl. A01k** *93/00*
**U.S. Cl. 43—43.14** **1 Claim**

A casting bubble which may be mounted upon a fishing line either for free sliding movement on the line or clamped to the line at a selected position of adjustment. The bubble includes an elongate hollow shell having a resilient tube mounted to extend through the interior of the shell from one end to the other. The tube is sealingly clamped to the shell at one end and carries a stopper at its opposite end engageable within an opening at the opposite end of the shell to seal the interior of the shell. The tube, in its unstretched condition, is somewhat shorter than the length of the shell so that the stopper is

resiliently held in sealing engagement within the opening by the tube. The line passes through the tube and is clamped when the stopper end of the tube is rotated to sufficiently

reduce the inner diameter of the tube. The stopper end may also be pulled outwardly of the shell to admit or release water for weight variation.

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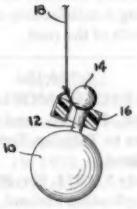
**3,744,177**
**DETACHABLE CONNECTOR AND FISHING MEANS COMBINATION**

**Oliver M. Cron, Jr., 6103 Vista Knolls, Paradise, Calif.**

**Filed Oct. 6, 1971, Ser. No. 186,938**
**Int. Cl. A01k *91/02, 95/00***
**U.S. Cl. 43—43.12** **5 Claims**



A fishing means and connector combination particularly adapted to attach fishing lines, nets, bobbers, sinkers, and the like, wherein a resilient member has a calibrated breakaway pull.

The fishing means has a cylindrical stud projecting therefrom on which an annular, resilient collar is normally loosely mounted. The collar has an interior dimension greater than that of the diameter of the stud, and has a length less than that of the stud. The collar, in its unstretched state, is retained on the stud by a spherical knob at the end of the stud and by the fishing means. The collar, when stretched, passes over the knob to release the fishing means.

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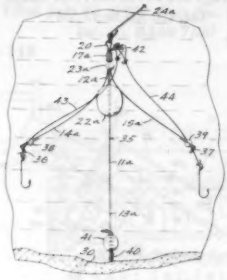
**3,744,178**
**FISHING SPREADER ASSEMBLY**

**Thomas A. Denny, Lorain, Ohio, assignor to Oberlin Canteen, Inc., Oberlin, Ohio**

**Filed Oct. 4, 1971, Ser. No. 186,327**
**Int. Cl. A01k *91/04***
**U.S. Cl. 43—42.74** **7 Claims**

The invention is a fishing spreader having a sinker weight which engages the bottom of a body of water. A vertically movable, freely slidable float holds the upper end of the spreader above the bottom, thereby placing the hooks in a proper position adjacent the bottom. The spreader has end loops through which pass the leaders for snelled fish hooks. A keeper member is provided for each loop, and means spaced from said loops is provided for attaching each leader to the spreader assembly. The sinker weight is removable and by



reversing the spreader, the hooks are positioned at a desired location adjacent the surface of the water.

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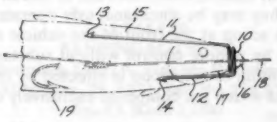
**3,744,179**
**BAIT FISH RIGGING**

**William E. Smith, 219 E. Main, Monroe, Wash.**

**Filed Feb. 22, 1971, Ser. No. 117,631**
**Int. Cl. A01k *83/06***
**U.S. Cl. 43—44.4** **9 Claims**



An apparatus for and method of rigging bait fish to maintain the mouth of the bait fish closed including a substantially circular member adapted to fit over the snout of the bait fish having at least one lateral run of a semi-rigid material comprising an anchor to hold the ring-like portion of the device in position. A second lateral run substantially perpendicular to the plane of said circular member may be provided if desired to engage and anchor the snout encircling portion of the device.

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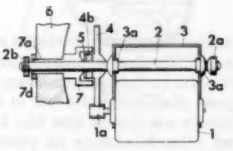
**3,744,180**
**PROPELLER DRIVE MECHANISM FOR A MODEL AIRPLANE**

**Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co., Ltd., Tokyo, Japan**

**Filed Dec. 2, 1971, Ser. No. 204,038**
**Claims priority, application Japan, Dec. 3, 1970, 45/106297**
**Int. Cl. F16d *41/00, 43/14***
**U.S. Cl. 46—78** **1 Claim**



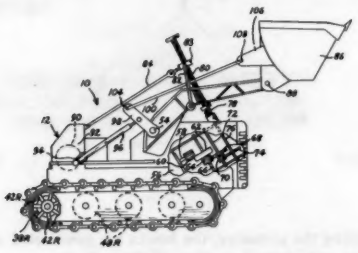
A propeller drive mechanism for a model airplane is disclosed, wherein a guide plate with guide grooves is rotatably mounted on a shaft in coupling with an output shaft of a drive motor, and clutch pins are fitted into the guide grooves so that the clutch pins may be protruded under the effect of centrifugal force. A clutch member to which a propeller is secured has shoulders for engaging with the clutch pins in their protruded position to receive drive force and a cam face for rendering the clutch pins inoperative to the clutch member.

3,744,181

## TOY FRONT LOADER WITH CATERPILLAR DRIVE

Robert A. Gagnon, Star Route 2, Box 944, Trail, Oreg.

Filed Aug. 15, 1972, Ser. No. 280,871
Int. Cl. A63h *33/26*
U.S. Cl. 46—244 A 6 Claims



The invention has to do with a front loader which includes caterpillar treads and remote control means for operating either tread, individually in a forward or reverse direction. Such individual operation of the treads turns the vehicle to the right or left depending on the identity of the tread operated and the direction in which it is operated. The treads may also be operated in unison, either forward or backward whenever desired, or they may be simultaneously operated in opposite directions. A scoop at the front of the vehicle may be raised and lowered by remote control without substantial tilting of the scoop. Tilting of the scoop is effected by remote control through trains which are composed exclusively of articulated, rigid members.

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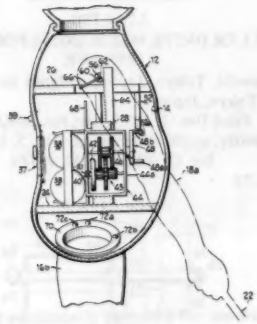
3,744,182

## SELF-PROPELLED TOY

Rouben T. Terzian, and Marvin I. Glass, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 8, 1969, Ser. No. 882,908
Int. Cl. A63h *33/26*
U.S. Cl. 46—247 14 Claims



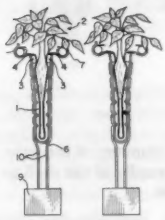
A self-propelled toy characterized by the provision of a movable weight mass in the interior of the toy including power operated mechamism which is effective to move the mass rapidly from a first position to a second position of impact with the toy body to effect propulsion of the toy. The invention is embodied in a jumping doll, wherein the arms hold a jump rope and are operated in timed sequence with the movement of the mass in the doll body. As the mass is moved into impact with the doll body, the doll jumps relative to its supporting surface. At the same time, the arms are moved to pass the jump rope beneath the momentarily raised feet of the doll.

3,744,183

## METHOD OF HYDROPONIC CULTIVATION

Naoe Kato, Midorigaoka 1-chome 25-ban 18-go, 386 Nagano-ken, Ueda-shi, Japan

Filed Dec. 3, 1971, Ser. No. 204,449
Claims priority, application Japan, Dec. 11, 1970, 45/110724; Dec. 11, 1970, 45/124134; Dec. 11, 1970, 45/124136; Dec. 11, 1970, 45/124137; Dec. 11, 1970, 45/124138
Int. Cl. A01g *31/02*
U.S. Cl. 47—1.2 13 Claims



A method of hydroponic cultivation of plants, comprising holding a plant in a suspended state, establishing contact between the root of the plant and a carrier member for flowing down nutrient solution disposed outwardly of the root, feeding nutrient solution from above the corner member to flow down therealong so that the nutrient solution may be fed to the root without immersing the root in the nutrient solution to establish constant and satisfactory contact between the root and air, thereby accomplishing a satisfactory cultivation free from the decay and undergrowth of the root.

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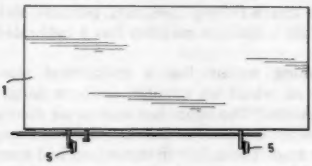
3,744,184

## SHIFTABLE PACKET MOULD PARTITIONS

Ossi Niemi, Tampere, Finland, and Heino Juvonen, Kreis, Germany, assignors to Toljalan Terasvalmiste KY Velj Virtanen, Toijala, Finland

Filed July 1, 1971, Ser. No. 158,951
Claims priority, application Finland, July 2, 1970, 1876/70
Int. Cl. B41b *11/56*; E05d *13/02*, *15/10*
U.S. Cl. 49—125 12 Claims



A transport wheel and rail assembly for the transfer of partition plates and support walls in packet moulds used in vertical casting of concrete elements, the plates and walls being provided with transport wheel assemblies movable along rails by means of rack and pinion drive mechanisms, the wheel assemblies in each plate or wall being arranged in such a way that part thereof travels along one side of a rail, the other travelling along the other side of the rail, thus making an overlapping arrangement of wheel assemblies belonging to adjacent plates possible.

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3,744,185

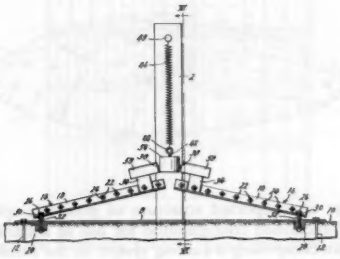
## CATTLE GATE

Richard D. Patterson, Latour, Mo.

Filed May 10, 1972, Ser. No. 251,934
Int. Cl. E06b *11/00*
U.S. Cl. 49—131 3 Claims

A cattle gate adapted to obstruct the gate opening of a fence, of such nature that while automotive vehicles may pass

freely thereover, cattle and other livestock will not, and consisting of a pair of barred, planar treadle panels disposed in edge-to-edge relation with their adjacent edges aligned with the fence line across the gate opening, and with their remote edges hinged to a ground plate at ground level, and an elevating means yieldably holding the contiguous edges of the panels in an elevated position above the ground plate so that said panels are inclined upwardly toward their contiguous edges, the panels being adapted to be depressed against the ground plate into coplanar relation by the weight of an automotive vehicle passing thereover.



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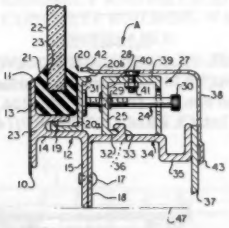
**3,744,186**

**VEHICLE WINDOW STRUCTURE**

**Keith W. Tantlinger, Rancho Sante Fe, Calif., assignor to Rohr Corporation, Chula Vista, Calif.**

**Filed Nov. 19, 1970, Ser. No. 90,940**
**Int. Cl. E06b 7/18**
**U.S. Cl. 49—463** **1 Claim**



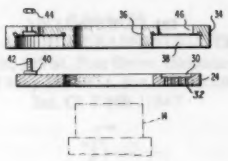
A window opening in a mass transit type railway car has an extrusion fitted marginally along the inward side of each edge thereof, each extrusion having an inwardly open angle seat to receive a rubber bezel fitted around the edge of a window glass. A pressure strip of Z-cross-sectional shape has its flat, intermediate portion mounted to bear against the inner side of the bezel, and a screw support member is removably attached to the extrusion inwardly of the Z-section strip. A screw is threadedly mounted in each support member to bear endwise against the Z-section strip, thereby anchoring the screw support members to the extrusion and urging the Z-section strip into squeezing, seating engagement with the bezel. A removable angle trim member covers and conceals the screw support members, the Z-section strip and the pressure screws.

**3,744,187**

**PLANETARY LAPPING MACHINE ABRADING PLATES**

**Francis P. Lynah, Jr., and Morton J. Leonard, Jr., both of Carlisle, Pa., assignors to P. R. Hoffman Company, Carlisle, Pa.**

**Filed July 22, 1971, Ser. No. 165,226**
**Int. Cl. B24b 7/00**
**U.S. Cl. 51—118** **3 Claims**



Lapping plates for a double lapping planetary machine are formed of 85 percent $AL_2O_3$ to provide precise dimensional control of workpieces. The top lapping plate is adjustably mounted to float on the workpieces and also permits the introduction of lapping slurry to the workpieces.

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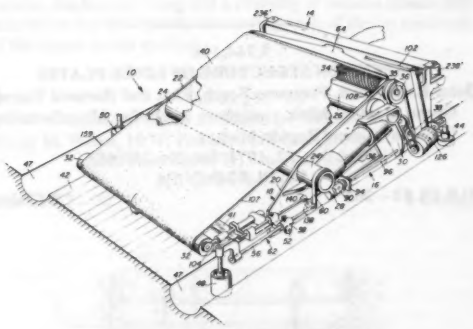
**3,744,188**

**SANDING MACHINE**

**Samuel H. Sharpless, 61-67 N. Pine St., Hazleton, Pa.**

**Filed Mar. 29, 1971, Ser. No. 128,679**
**Int. Cl. B24b 23/00**
**U.S. Cl. 51—174** **26 Claims**



This disclosure relates to a sanding machine for use in sanding and refinishing horizontal surfaces. The sanding machine includes a frame movably mounted on drive wheels which permit the machine to move longitudinally along the horizontal surface. Forward and rear rollers are rotatably mounted on the frame and carry an endless abrasive belt. The forward roller is contiguous to the horizontal surface while the rear roller is positioned above and to the rear of the forward roller so that the belt is angularly disposed with respect to the horizontal surface. The belt is held in contact with the horizontal surface by a platen located behind the forward roller and secured to the frame. The rear roller is driven and imparts movement to the endless belt. Horizontal leveling means permit the platen to be maintained in a level position transverse to the direction of movement of the machine. A belt tracking means maintains the endless belt in a preselected tracking position with respect to the forward and rear rollers.

**3,744,189**

## AUTOMATIC ADJUSTING APPARATUS FOR FRONT COVER OF GRINDING WHEEL GUARD AND COOLANT NOZZLE

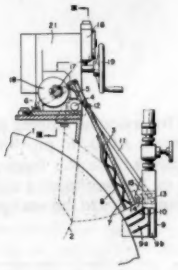
**Ichizo Kakumu, Nagoya-shi, and Teruyuki Ito, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan**

**Filed Dec. 23, 1971, Ser. No. 211,384**

**Claims priority, application Japan, Dec. 26, 1970, 45/129796**

**Int. Cl. B24b *55/04***

**U.S. Cl. 51—267** **5 Claims**



A diameter of a grinding wheel is continuously being decreased by dressing operations performed thereon. Depending upon a decrease in the diameter of the grinding wheel, the position of a front cover of a grinding wheel guard and a coolant nozzle therefor, and the angle of the coolant nozzle for spraying are automatically adjusted by a link coupling mechanism pivoted to the front cover and to the coolant nozzle.

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**3,744,190**

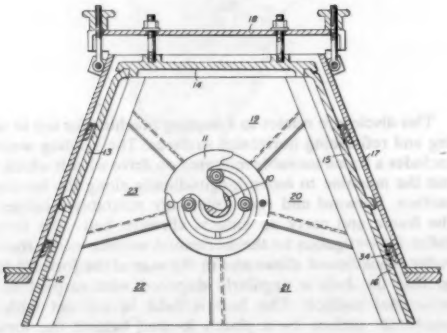
## SUSPENSION STRUCTURE OF LINER PLATES

**John E. DeGroot, Pompano Beach, Fla., and Bernard Fuerst, Grand Rapids, Mich., assignors to Benfur Manufacturing Company, Grand Rapids, Mich.**

**Filed Dec. 22, 1971, Ser. No. 210,653**

**Int. Cl. B24b *55/04***

**U.S. Cl. 51—268** **5 Claims**



A structure for supporting liner plates of cast hard alloy, in which the configuration of the plates maintains a substantially constant cross-section to eliminate porosity by assuring uniform cooling.

**3,744,191**

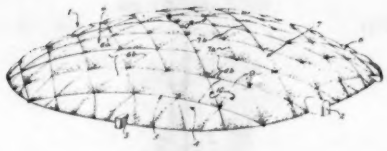
## LARGE AIR SUPPORTED STRUCTURES

**Walter W. Bird, Williamsville, N.Y., assignor to Birdair Structures, Inc., Buffalo, N.Y.**

**Continuation of Ser. No. 862,245, Sept. 30, 1969. This application Dec. 14, 1971, Ser. No. 207,914**

**Int. Cl. E04b *1/345*; E04g *11/04***

**U.S. Cl. 52—2** **20 Claims**



A large air supported structure of generally spherical or spherical-sectioned configuration for use as a stadium cover or the like comprising a cabling system in the form of lattice work of cables attached at their points of intersection by joining devices, so as to form interstices of triangular shaped configuration, and an air inflatable envelope having elements thereof closing the cable interstices and formed with a double curvature configuration having radii of curvature substantially smaller than the radius of curvature of said structure.

In the preferred embodiment, the cabling system includes three groups of continuous cables arranged such that the centermost cables of the groups intersect adjacent the crown of the spherical structure at approximately 60° angles and the groups of cables cooperate to define interstices approximating equalateral triangles. Also, the envelope elements are preferably in the form of individual panels removably joined about their marginal edges to the cables defining the interstices. Sealing devices are arranged so as to provide an air seal between adjacent envelope panels outwardly of the cabling system, such that panels are removable outwardly of the structure, while the cabling system is fully enclosed but accessible internally of the structure.

An inflatable work access shelter is removably attachable to the outer surface of the structure by anchoring devices carried by the cabling joining devices, so as to permit replacement or repair of individual panels from a point exteriorly of the structure without loss of inflation air therefrom.

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**3,744,192**

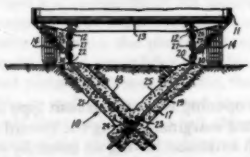
## HOUSE TRAILER GROUND ANCHOR

**George E. Burnett, 1020 Josephine St., Marinette, Wis.**

**Filed Feb. 15, 1972, Ser. No. 226,600**

**Int. Cl. E02d *5/80*; E04h *9/14***

**U.S. Cl. 52—23** **5 Claims**



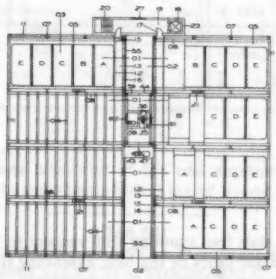
A ground anchor for house trailers which includes a pair of cylindrical concrete members which extend angularly into the ground at a converging angle and intersect well below the ground. A rod is embedded in each of the cylindrical concrete members with the rods interlocking at their juncture. Turnbuckles connect the upper ends of the rods to the frame of a house trailer and additional turnbuckles connect to straps which engage over the top of the trailer to prevent the trailer from becoming separated from its frame.

3,744,193

## HIGH-RISE VERSATILE MOBILE HOME STRUCTURE

Dicksen T. W. Lau, 450 17th Avenue, San Francisco, Calif.

Filed Mar. 9, 1972, Ser. No. 233,022
Int. Cl. E04h 6/06; B66b 9/00
U.S. Cl. 52—30 8 Claims



The High-rise Versatile Mobile Home Structure comprises two main components: the high-rise structure consisting of a series of compartments on each level in its two wings used for parking the versatile mobile homes and the mobile home elevator used to raise or lower the sections of the versatile mobile home when they are being hauled into or from the compartments. The high-rise structure is only a skeleton framework without solid walls and floors. The mobile home elevator consists of an elevator tower and an elevator carrier. The tower which carries a hoisting machine at the top and is equipped with four rollers at the bottom can be moved forth and back on the two rails. The three-level carrier which is lifted and lowered by the hoisting machine also has no solid floors. When a section of the versatile mobile home is hauled into the carrier, it is supported by two travelling beams with castors fixed at their two ends. Each section together with the travelling beams is pulled either into or from a compartment by means of an electric motor and a winch. Along both sides of the elevator-well there are walkways leading to a hall tower with a staircase and a passenger elevator inside located in front of the structure. This hall tower has solid floor, walls and roof.

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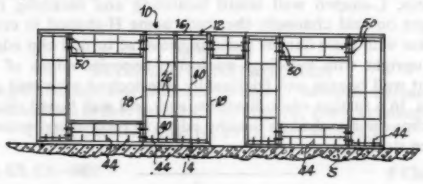
3,744,194

## REINFORCING ASSEMBLY AND METHOD OF FORMING REINFORCED CONCRETE BUILDING WALLS, ROOFS AND THE LIKE

Lawrence R. Ramberg, 8801 Golf Road, Des Plaines, Ill.

Filed July 6, 1971, Ser. No. 159,643
Int. Cl. E04b 1/16
U.S. Cl. 52—378 20 Claims



An improved system and method for forming concrete walls and roofs, such as for one and two story housing.

A pretabricated frame assembly is formed of a plurality of peripheral frame members defining a rectangular peripheral frame section. Reinforcing rods are supported by an opposite pair of members and other reinforcing rods are secured to and cross the first reinforcing rods, thereby to form an open reinforcing network. The members provide surfaces to which panel board may be secured. A suitably configured plurality of the frame assemblies are positioned seriatim on a slab, are connected by short reinforcing rods to form a wall frame, a complete house frame and a roof. The array of frame assemblies, especially after panelling has been applied internally provides a skeleton reinforcing network to which concrete may then be applied to form a reinforced concrete structure.

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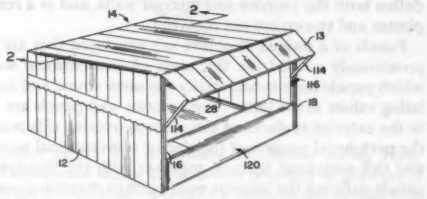
3,744,195

## COLLAPSIBLE FRAME STRUCTURE

Richard F. Ferkich, 305 St. Pete Drive, Oldsmar, Fla.

Filed May 13, 1971, Ser. No. 143,008
Int. Cl. E04b 1/347
U.S. Cl. 52—63 16 Claims



A collapsible frame primarily designed to support an outer protective canvas-like material in such a manner as to define an enclosure which can be utilized as a carnival type concession stand or the like. The frame comprises a plurality of cooperatingly positioned, vertically and horizontally arranged support beams all removably attached to one another and auxiliary support beams interconnecting the main vertical and horizontal support beams so as to maintain the frame structure in a desired configuration. The frame further includes rafters defining the roof structure, display support means on which various displays are hung and a plurality of various connecting assemblies for detachably connecting each of the components of the frame to one another.

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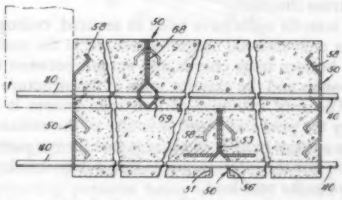
3,744,196

## HINGED SLAB SYSTEM OF BUILDING

Harry M. Weese, 10 W. Hubbard St., Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 181,693
Int. Cl. E04b 1/344
U.S. Cl. 52—70 5 Claims



A modular system of building constructed by casting reinforced slabs having embedded transverse hinge elements located at spaced intervals and folding the slabs into sleeve-like parallelogram modules or tunnels. The modules are stacked and grouted together in various arrangements to form four part structural elements of a building. The hinge elements are folded annealed metal strips having cut-out slots for interfitting with the reinforcing wires, punched-out tabs for embedding in the concrete slab, and notches to produce a plane of weakness at the bending point.

3,744,197

## BUILDING STRUCTURE

Adolph H. Wetzel, Jr., 1987 Ritchey Avenue, Santa Ana, Calif.

Filed Jan. 27, 1972, Ser. No. 221,291
Int. Cl. E04b 7/04, 2/82
U.S. Cl. 52—92 7 Claims

A low cost building of a post and beam structure in which prefabricated panels are splined together side-by-side to define both the exterior and interior walls, and as a result lath, plaster and stucco are not required.

Panels of a unique structure are employed that are but approximately a third the thickness of conventional walls, but which panels have substantially the same sound and heat insulating values as the latter. The exterior wall panels are secured to the exterior surfaces of the posts to overlap sills recessed in the peripheral portion of the slab or conventional wood floor, and this structural feature, together with the thinness of the panels defining the interior wall, permits maximum usable living area to be attained from a foundation-supported floor.

A building embodying the present invention has the construction costs thereof substantially reduced in that the panels are thin and relatively light in weight, are easy to handle, and are of such design that they may be readily secured to the posts and beams that are to define an exterior wall while the posts and beams are in a horizontal position. When the panels are secured to the post and beam wall structure, a completed exterior wall is provided, and the wall may be tilted as such into a vertical position where it is permanently secured to a wood sill that is recessed in a peripheral portion of the poured concrete slab or conventional wood floor.

Interior walls are provided by splining the panels together with the upper portion of the interior walls being secured to the bottom truss chord of the roof structure, and the lower portions of the interior walls resting on redwood wood sills that overlie the center portion of clips of deformable sheet material that are flat, and have the center portion thereof anchored to the floor. After the interior walls and sills have been mounted on the clips, the exterior edge portions of the clips are bent or deformed upwardly to grip the sills and lower portions of the interior wall panels therebetween, with the interior wall panels now being anchored to both the floor and the bottom truss chords.

After the interior walls have been so secured, ceiling finish material of a conventional nature is secured to the underportions of the bottom truss chords and extend between the interior wall panels and the exterior walls of the structure above described. The roof structure of free span trusses is totally supported by the post and beam structure of the exterior side walls, and as a result neither the panels that form a part of the exterior walls nor the interior panels that define interior walls are subjected to the roof load.

The panels are formed with electrical wiring receways therein, and the connecting of panel-supported switches and outlet boxes to a source of electric power is a simple matter.

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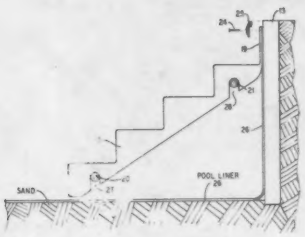
3,744,198

## STAIR CONSTRUCTION FOR PLASTIC LINER SWIMMING POOLS

Emil J. Boassy, Berkeley Heights, N.J., assignor to Champion, Inc, Scotch Plains, N.J.

Filed June 9, 1972, Ser. No. 261,532
Int. Cl. E04b 3/16
U.S. Cl. 52—184 9 Claims

The specification describes a stair for a plastic liner type swimming pool. The stair is preformed from rigid plastic and may have anti-slip patterns formed on the treads. The stair is installed in a recess in the pool wall from supports which




suspend the stair free standing with respect to the pool liner. The supports are pipes or the like, extending from the lateral walls of the recess through water-tight fittings.

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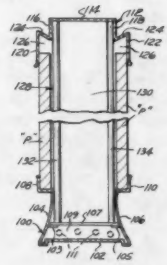
3,744,199

## DEMOUNTABLE WALL PARTITION

William J. Navarre, Riverview, Mich., assignor to Prudent O. Blancke, Grosse Pointe Park, Mich., a part interest

Continuation-in-part of Ser. No. 756,514, Aug. 3, 1968, Pat. No. 3,537,219. This application Oct. 9, 1970, Ser. No. 79,386
Int. Cl. E04h 1/00
U.S. Cl. 52—211 4 Claims



A demountable wall partition for use between a floor and ceiling, opposed floor and ceiling channels, with longitudinally spaced upright stud and stud spacing tabs projected from the channels in one embodiment. The upright spaced studs extending into said channels for interlocking engagement therein. L-shaped wall board mounting and retaining trim flanges on said channels; the studs being H-shaped in cross-section with their flanges including reverse turned clip edges, and upright trim moldings enclosing opposite edges of adjacent wall boards and frictionally interlocked with said clip edges. In a further embodiment spacer and wall board retaining clips are attached to the clip edges to receive and retain a batten strip.

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3,744,200

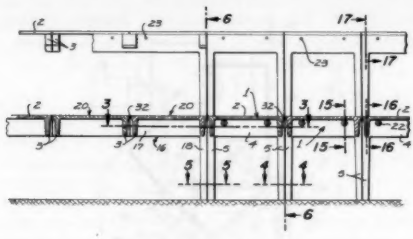
## PRECAST CONCRETE BUILDING CONSTRUCTION

Edward K. Rice, 2077 Linda Flora Drive, Los Angeles, Calif.

Filed June 2, 1969, Ser. No. 837,986
Int. Cl. E04b 1/343; E04c 3/20
U.S. Cl. 52—227 13 Claims

A building construction utilizing precast concrete building units which are positioned side-by-side and end-to-end as well as stacked to form a multistory structure; the units being secured together by tendons freely threaded through horizontal and vertical chases provided in the building units, placed

under tension and anchored at their extremities. The building units may also include precast beams containing longitudinal



catenary tendons anchored at the end extremities of each building unit, the units being bolted in end-to-end relation.

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**3,744,201**

**MOUNTING SUPPORT AND SEAL FOR WINDOW PANES, ESPECIALLY FOR WINDSHIELDS**

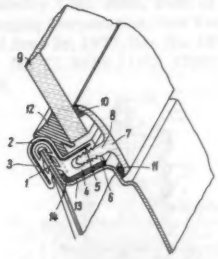
**Hans Dochnahl, Willich, Germany, assignor to Draftex GmbH, Rhineland, Germany**

**Filed Mar. 15, 1971, Ser. No. 123,960**

**Claims priority, application Germany, Mar. 24, 1970, P 20 15 496.5**

**Int. Cl. B60j *1/02***

**U.S. Cl. 52—400** **10 Claims**



A mounting support and seal for windows and windshields in motor cars is disclosed where a U-shaped edge covering strip is clamped to a flange that is integral with the car body. A U-shaped shoulder extends at right angle from the lower portion of the outer arm of the edge covering strip. A slightly bent holding lath has a projecting central tongue adapted for being plugged into the groove of the U-shaped shoulder to form a joint therewith. The windshield seats on the upper arm of the shoulder and clamps by its weight the toothed groove-tongue joint together. Sealing strips are provided from each side of th e windshield between the top portion of the edge covering strip and the end of the holding strip.

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**3,744,202**

**BUILDING CONSTRUCTION**

**Georg Hubmann, Harlachinger Strasse 17, Munich, Germany**

**Continuation of Ser. No. 825,370, May 16, 1969, abandoned. This application Aug. 16, 1971, Ser. No. 172,179**

**Int. Cl. E04c *2/04***

**U.S. Cl. 52—600** **5 Claims**

A constructional element comprises two concrete shells which are reinforced by basic steel mats and by parallel mat strips which are bent so as to connect the two shells.

**3,744,203**

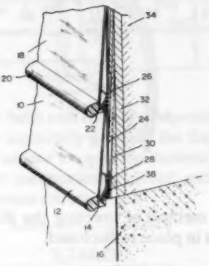
**BUMPER GUARD FOR ALUMINUM SIDING**

**Louis F. Sablom, Jr., Irvington, N.J., assignor to S.K.A.S.S. Associates Ltd., Loch Sheldrake, N.Y.**

**Filed Nov. 5, 1971, Ser. No. 195,910**

**Int. Cl. E04d *13/00*; E04c *2/38*; E04f *19/02***

**U.S. Cl. 52—624** **7 Claims**



A bumper guard for protecting aluminum siding from damage. Aluminum siding consists of a plurality of aluminum members fixed to an exterior wall of a building and at least one of the aluminum members has a bumper guard which extends beyond the outermost edge of the member. A bumper guard is also attached to the outermost edge of an aluminum gutter, which gutter is attached adjacent to an edge of the roof of the building, to prevent the gutter from being dented by a ladder which may be placed thereagainst.

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**3,744,204**

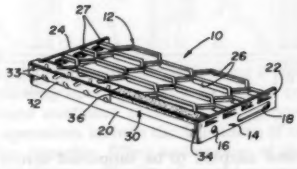
**UNIT PLATFORM**

**Donald C. Eshler, Warren, Ohio, assignor to United States Gypsum Company, Chicago, Ill.**

**Filed Apr. 24, 1972, Ser. No. 246,673**

**Int. Cl. E04c *2/42***

**U.S. Cl. 52—671** **8 Claims**



A unit platform comprising a grating supported at three sides thereof by a portion of a frame underlying the grating, the supporting portions being outwardly lanced projections giving under-support to the grating while remaining integrally attached at their ends to the frame.

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**3,744,205**

**METHOD OF ERECTING PREFABRICATED SHELTER**

**Charles W. Moss, Ann Arbor, Mich., assignor to Tension Structures, Inc., Milan, Mich.**

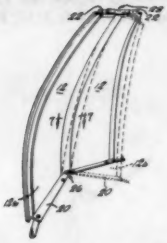
**Division of Ser. No. 32,051, April 27, 1970, Pat. No. 3,675,380. This application Mar. 1, 1972, Ser. No. 230,807**

**Int. Cl. E04b *2/12, 1/32*; B23p *11/00***

**U.S. Cl. 52—747** **2 Claims**

A shelter which has panels bowed and secured together in a stressed condition to define a domelike building. An improved

flexible joint is provided between the panels to aid in erecting and in retaining the structure together, and to provide a



weather seal. A method of erecting the shelter and inserting the flexible joints in place is disclosed.

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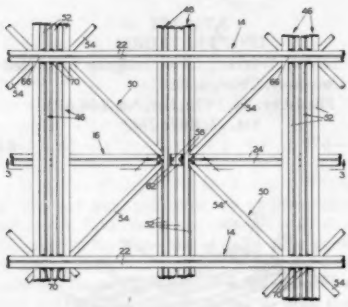
**3,744,206**
**HEAVY DUTY SPACE FRAME FOUR-WAY SPACE FRAME**

Sherman A. Nelson, 4224 Whitehead St., Boise, Idaho; Donavon D. Nickel, 10900 W. 76th Drive, Arvada, Colo., and Neil F. Dunbar, 3050 S. Bellaire St., Denver, Colo.

Filed May 27, 1971, Ser. No. 147,539
Int. Cl. E04c *3/04*
U.S. Cl. 52—650 4 Claims



A space frame adapted to be supported across a bearing support comprises a plurality of spaced, substantially parallel chords arranged in upper and lower planes. A plurality of joist-type web members are disposed between the chords of the two planes, transversely of the chords. Connecting means interconnect the chords and web members. Support means for the chords and web members support the same separately on the bearing support. The completed assembly thus becomes a two-way joist system whereof the joist-type web members comprise one set of joists and the transversely arranged chords interlocked with the web members comprise the other set.

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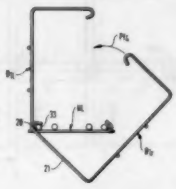
**3,744,207**
**REINFORCEMENT FOR REINFORCED CONCRETE STRUCTURES**

Georgi Oroschakoff, Simon-Denk-Gasse 7/7, Vienna, Austria

Filed May 10, 1971, Ser. No. 141,614
Int. Cl. E04c *2/42, 5/00*
U.S. Cl. 52—664 12 Claims

Reinforcing sections which are two-dimensional or angled and/or C-shaped can be non-positively connected at least in pairs to form self-supporting reinforcements which have any desired shape and are rigid and resist tension and compression. The sections are connected by causing them to extend one into the other, hooking one onto the other and snapping one onto the other.



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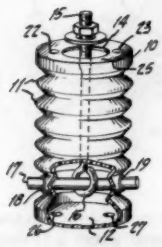
**3,744,208**
**GROUT ACCOMMODATING SHELLS FOR EASY STORAGE AND TRANSPORT**

Abram N. Spanel, 344 Stockton St., Princeton, N.J.

Continuation of Ser. No. 821,841, May 5, 1969, abandoned.
This application Oct. 19, 1971, Ser. No. 190,560
Int. Cl. E04b *1/41*
U.S. Cl. 52—706 10 Claims



There is disclosed outer shells for use with concrete inserts or locking sleeves fabricated from plastic or elastomeric materials, round or otherwise geometrical in cross section, a large portion of the length of the shell is accordion pleated, with the plastic pleat areas sufficiently flexible to permit the entire assembly to be compressibly collapsed along its length and held by suitable means in the collapsed position for storage and transport.

Other embodiments show elongated carton-like configurations, which are foldable for easy storage transport.

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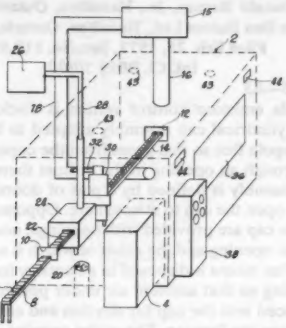
**3,744,209**
**STERILIZED PACKAGING SYSTEM**

Thomas F. Conley, Dixon, and George A. Muck, Rockford, both of Ill., assignors to Dean Foods Company, Rockford, Ill.

Continuation-in-part of Ser. No. 21,159, March 19, 1970, abandoned. This application Jan. 13, 1971, Ser. No. 106,112
Int. Cl. B65b *31/02*
U.S. Cl. 53—22 R 10 Claims

This application discloses sterile canning apparatus and method which utilizes a closed chamber in which is maintained a microorganism-killing atmosphere and in which product containers are sterilized, filled with a sterile product, and the closures for the containers are sterilized and applied in

a sterile atmosphere to ensure a sterile product. In order to achieve high production rates, an operator in protective



clothing may enter the chamber to maintain the equipment and thus maintain the sterile environment.

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**3,744,210**

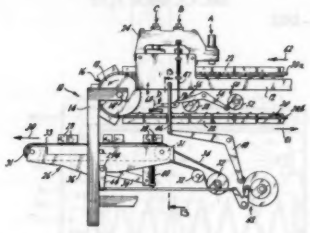
**PACKAGING MACHINE AND METHOD**

**Anthony J. O'Lenick, Fairlawn; Douglas P. Roome, Cedar Grove, both of N.J.; Rudolf A. Spyra, Crystal Lake, and Ihor Wyslotsky, Country Club Hills, both of Ill., assignors to Standard Packaging Corporation, New York, N.Y.**

**Filed June 28, 1971, Ser. No. 157,228**

**Int. Cl. B65b** *31/02, 57/02*

**U.S. Cl. 53—22 A** **4 Claims**



A machine and method for packaging cheese are disclosed as including apparatus having a four unit die for enabling the vacuum packaging of four cheese packages at any one time. The packages are formed by top and bottom plastic webs which are first partially sealed, then evacuated, then finally sealed, partially cut, examined for leaks, and then fully cut and separated to eliminate defective packages. The examination for leaks is accomplished by a novel leak detection system including apparatus for sensing package leaks after final seal has been accomplished.

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**3,744,211**

**AUTOMATIC BAG FILLING METHOD**

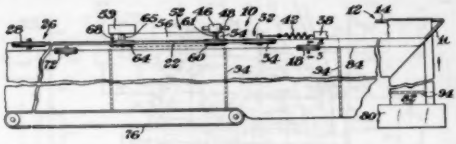
**Oliver R. Titchenal, Berea, and William A. Armstrong, Brookpark, both of Ohio, assignors to The Dow Chemical, Midland, Mich.**

**Continuation-in-part of Ser. No. 132,808, April 9, 1971, Pat. No. 3,699,746, which is a continuation of Ser. No. 727,545, May 8, 1968, abandoned. This application June 7, 1971, Ser. No. 150,276**

**Int. Cl. B65b** *43/12*

**U.S. Cl. 53—29** **4 Claims**

Method wherein guide means "track" a continuous thickened profile formed along the top edge portion of a chain of bag elements to accurately guide the bags as the same are advancing into the apparatus for filling. Such a profile can comprise a bag fastener such as a continuous bead receivable in a groove member, the fastener normally being associated with freely spreadable flaps between which the bag elements are filled. The guide means are preferably assisted by opposed continuous belts movably supporting the bags along the flap



region thereof. The belts can further cooperate with collapsible spout means for separately gripping the flaps, and employing the same as tab means to open the fastener for filling; and the fastener is later automatically closed such as between a pair of grooved pressure rollers.

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**3,744,212**

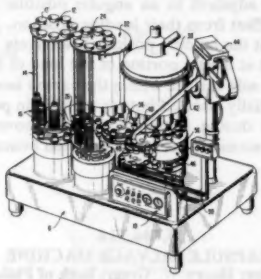
**AUTOMATIC PLASTIC BOTTLING SYSTEM AND METHOD**

**Robert J. Mistarz, Northbrook, and Albert B. Mojonnier, Sr., Chicago, both of Ill., assignors to Koehring Company, Milwaukee, Wis.**

**Filed June 17, 1971, Ser. No. 154,058**

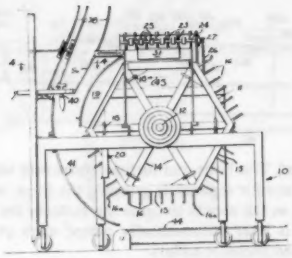
**Int. Cl. B65b** *3/02, 7/28*

**U.S. Cl. 53—29** **8 Claims**



A method and apparatus for performing a plurality of successive processing operations with individual container sections or joined container sections forming containers. The processing operations include the dispensing of container sections and the assembly, filling and sealing of the containers. On a single platform, a plurality of spaced processing units are rotatably mounted. Each unit includes a plurality of circumferentially spaced carrier stations for moving container sections or containers about the unit axis of rotation. A plurality of spaced star wheel transfer units are disposed intermediate and adjacent the processing units. The star wheels receive container sections or containers from and deliver them to the processing units at transfer zones defined generally tangentially of each of the processing units and an adjacently disposed star wheel unit. The transfer unit is rotatably mounted on the platform and includes a plurality of circumferentially spaced carrier stations for moving the container sections or containers about the axis of rotation. The circumferential spacing of said carrier station on the transfer and processing units is substantially the same throughout; and the transfer and processing units are geared together for simultaneous rotation, with said carrier stations of each of the processing units and an adjacently disposed transfer unit rotating in opposite angular directions. The initial processing units are comprised of first and second denesters for supplying individual container sections to an adjacent transfer unit.

3,744,213
APPARATUS FOR LOADING BOTTLES INTO CARTONS
Reinhold A. Pearson, 304 E. 2nd Avenue, Spokane, Wash.
Filed Oct. 21, 1970, Ser. No. 82,558
Int. Cl. B65b 5/08, 21/14
U.S. Cl. 53—243 4 Claims



Bottles or similar articles are placed in a pre-selected array from peripheral side surfaces of a wheel rotatably mounted about a horizontal axis. The bottles are held in position on the wheel by guides that protrude outwardly from the wheel side surfaces beyond the centers of gravity of the bottles to prevent tipping of the bottles until after the guides have been rotated through a horizontal orientation. After each side surface of the wheel receives a load of articles at a loading position, the wheel is momentarily released to permit limited rotational movement of the wheel about its axis due to the unbalance of the loads resting on its side surfaces. Open cartons are sequentially fed along guides that lead to a holding position tangential and outwardly adjacent to an angular position of the wheel side surfaces offset from their loading position. A reciprocating apparatus at the holding position selectively engages each carton to insert at least a portion of the load of bottles on the adjacent wheel side surface within the carton boundaries. The carton and partially inserted bottles are held in position by additional guides during further rotational movement of the wheel and are released after being inverted beneath the wheel axis.

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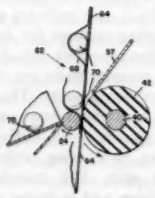
3,744,214
CAPSULE SALVAGE MACHINE
Leonard J. Dolce; Henry W. Greer, both of Philadelphia, Pa., and George E. Martell, Runnemede, N.J., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.
Filed Sept. 28, 1971, Ser. No. 184,352
Int. Cl. B65b 69/00
U.S. Cl. 53—381 R 4 Claims



A machine for stripping capsules from a strip package having a backing sheet and a pocket sheet has a pair of rollers. One roller is for contact with the backing sheet and the other roller is for contact with the pocket sheet. The rollers are driven in opposite directions to advance a strip package through the rollers and rupture the pockets in the pocket sheet to release the capsules which are carried away by a chute leading to a conveyor.

3,744,215
METHOD AND APPARATUS FOR CUPOLA EMISSION CONTROL
Thomas Donald Barnes, Jr., Hamilton, Ontario, Canada, assignor to Don Barnes Ltd., Hamilton, Ontario, Canada
Filed Feb. 25, 1971, Ser. No. 118,926
Int. Cl. B01d 50/00
U.S. Cl. 55—83 22 Claims

A cupola emission control system is disclosed which includes a cylindrical cap assembly adapted to be mounted on top of a cupola flue so that gases from the cupola enter the assembly through an opening in the bottom thereof. The top of the cap assembly is defined by a pair of doors adapted to be opened to open the cap to atmosphere. Opposed side wall portions of the cap are provided with openings, one of which is an ambient air opening and the other of which is a mixture outlet opening. Fan means is disposed in a ductway leading to the air inlet opening so that ambient air under positive pressure can be introduced into the cap for dilution and cooling in the cap of gases from the furnace. The outlet opening is connected to a pair of separator units which are serially arranged between the cap housing and an exhaust stack for the system. An exhaust fan is associated with the output side of the second separator leading to the stack in order to induce flow of furnace gases through the system to the stack.

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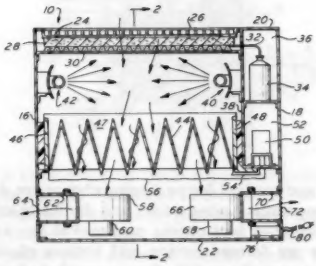
3,744,216
AIR PURIFIER
John J. Halloran, Roslyn, Pa., assignor to Environmental Technology Corporation, Newtown, Pa.
Filed Aug. 7, 1970, Ser. No. 62,121
Int. Cl. B03c 3/38
U.S. Cl. 55—102 8 Claims



An air purifier is provided for purifying air in rooms of a home, office, or other commercial establishment. Air is filtered by a mechanical filter, then odors are removed from the air, and the air is exposed to germicidal lamps for killing bacteria, then the air passes through a high efficiency electrostatically enhanced filter, and then it is returned to the room by blowers.

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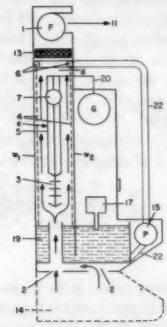
3,744,217
HIGH-VOLTAGE OZONE-FREE ELECTROSTATIC AIR FILTER
Paul Ebert, Huntingue, France, assignor to Aeropur, A.G., Zug, Switzerland
Filed Dec. 23, 1970, Ser. No. 101,050
Int. Cl. B03c 3/38
U.S. Cl. 55—118 6 Claims

An electrostatic air filter having an air duct defined in part by opposed walls over which liquid flows continuously. An electrode is suspended between the aforesaid walls and

cooperates therewith to purify the air flowing through the duct. The electrode is connected to a high voltage source and



is preferably divided into two parts, one of which is designed to produce a strong ionization with spray discharge.

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**3,744,218**

**APPARATUS FOR CLEANING GASES THROUGH IONIZATION**

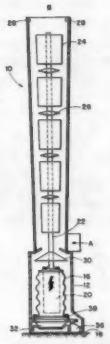
**Paul Ebert, Huningue, France, assignor to Aeropur, A. G., Zug, Switzerland**

**Filed Apr. 13, 1971, Ser. No. 133,509**

**Claims priority, application Sweden, Nov. 24, 1970, 17543/70**

**Int. Cl. B03c** *3/78*

**U.S. Cl. 55—118** **9 Claims**



An electrostatic precipitator for cleaning exhaust gases through ionization, including a high voltage generator installed in a stationary insulator within a chimney flue. The stationary insulator supports a carrying axle onto which a number of hollow high potential discharge electrodes are mounted and which has a direct electrical contact with the high voltage generator output. The carrying axle conducts a voltage produced by the generator to the mounted electrodes. The chimney flue serves as a discharge channel in which a collecting electrode is provided in the form of a continuous film of water flowing down along the inside walls of the chimney flue.

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**3,744,219**

**MULTIPLE-LOOP CHROMATOGRAPHY SYSTEM**

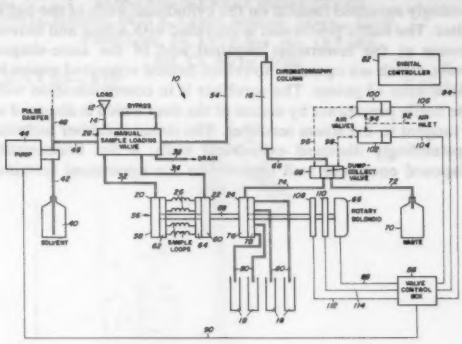
**Roger C. Tindle, and David L. Stalling, both of Columbia, Mo., assignors to The United States of America as represented by the Secretary of Interior, Washington, D.C.**

**Filed Feb. 29, 1972, Ser. No. 230,426**

**Int. Cl. B01d** *15/08*

**U.S. Cl. 55—162** **11 Claims**

An automated chromatography system employs multiple-port rotary valves for sample storage, introduction and collection. Between the corresponding stator ports of a pair of valves, multiple sample loops are connected in series with inlet and outlet ports by rotating the mechanically linked valve ro-



tors. A third mechanically linked rotary valve distributes the output of a chromatography column to a series of independent sample receivers.

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**3,744,220**

**DEVICE FOR IMPARTING A TWIST TO A FLOW OF RAW GAS IN A TORNADO FLOW SEPARATOR**

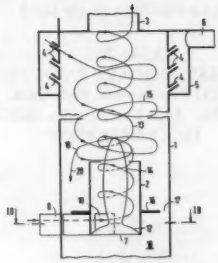
**Heinrich Klein, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Oct. 26, 1971, Ser. No. 192,142**

**Claims priority, application Germany, July 24, 1971, P 21 37 128.8**

**Int. Cl. B04c** *3/06*

**U.S. Cl. 55—261** **8 Claims**



To impart a twist in an incoming flow of raw gas in a tornado flow separator, an inlet duct located within and coaxial to a vortex chamber is provided with at least one supply inlet for the raw gas extending tangentially thereto and communicating therewith. The inlet duct has a closed end which is substantially conical in shape.

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**3,744,221**

**EXHAUST CLEANER**

**Samuel Scott Ross, 1570 Sunset Strip, Mountain Home, Idaho**

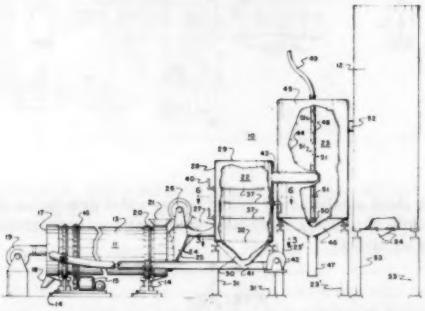
**Filed Nov. 26, 1971, Ser. No. 202,291**

**Int. Cl. B01d** *50/00*

**U.S. Cl. 55—263** **6 Claims**

The exhaust cleaner of this invention generally comprises a baffle precleaner and a steam scrubber. The baffle precleaner comprises upstanding cylindrical walls, an enclosure wall fastened at the uppermost terminal end of the cylindrical walls, and downwardly projecting cone-shaped walls fastened at the lowermost terminal end of the cylindrical walls. The baffle precleaner is provided with a baffle filter at the lower-

most terminal end of its cylindrical walls, and a plurality of filter screens distally disposed at intervals in alternatingly opposingly mounted fashion on the cylindrical walls of the baffle filter. The baffle precleaner is provided with a duct and blower means at the lowermost terminal end of the cone-shaped walls, which are operable to return heated separated gasses to the source of gasses. The scrubber is in communication with the baffle precleaner by means of the duct which is disposed at a tangent to the steam scrubber. The steam scrubber includes upstandingly disposed cylindrical walls, a flat horizontally disposed enclosure wall fastened to the uppermost terminal



end of the cylindrical walls, and downwardly projecting substantially cone-shaped walls fastened at the lowermost terminal end of the cylindrical walls. The scrubber is provided with a dependingly mounted steam conduit supplied with steam under pressure from a suitable source. A steam conduit includes a plurality of suitably disposed exitways. The steam scrubber is provided with an exitway through which condensed water and steam is discharged at the lowermost terminal end of the cone-shaped walls, and is provided with a heat exhaust conduit discharging means operable to discharge heat and the like into a suitable exhaust stack.

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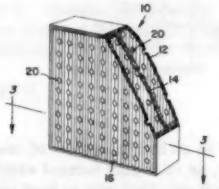
**3,744,222**

**CORRUGATED BOARD PAINT FILTER**

**Alexander Delao, 3732 Bell Avenue, Bell, Calif.**

**Filed Dec. 16, 1970, Ser. No. 98,535**
**Int. Cl. B01d *45/08***
**U.S. Cl. 55—446** **7 Claims**



A filter for a paint spray booth comprising three walls of single face corrugated board having holes in each wall offset from holes in an adjacent wall; a rear wall has forwardly extending sides, a second wall within the sides has forwardly and rearwardly directed spacer flaps, and a third wall is supported at the forward edges of the sides.

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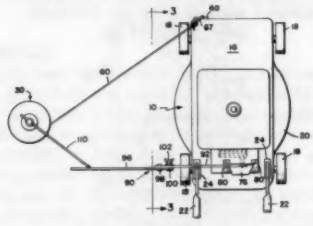
**3,744,223**

**LAWN MOWER APPARATUS**

**Warren Jensen, Atco, N.J., assignor to Atco Enterprises, Atco, N.J.**

**Filed Mar. 31, 1972, Ser. No. 239,907**
**Int. Cl. A01d *75/00***
**U.S. Cl. 56—10.2** **9 Claims**

Apparatus for controlling operation of a self-propelled lawn mower for moving a circular lawn area. The apparatus includes a reel located at the center of the circular area and a line wound on the reel and attached to a front corner of the lawn mower for controlling the lawn mower movement so that



it moves in a decreasing spiral path to mow the circular area around the reel. A stop mechanism is provided for automatically stopping operation of the self-propelled mower when it nears the center of the spiral path near the reel.

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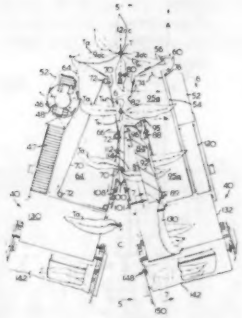
**3,744,224**

**TOBACCO HARVESTER**

**Leonard A. Chapman, London, Ontario, Canada, assignor to Eagle Machine Company Limited, London, Ontario, Canada Division of Ser. No. 52,345, July 6, 1970. This application Feb. 18, 1972, Ser. No. 227,482**

**Claims priority, application Canada, Feb. 25, 1970, 075,838**
**Int. Cl. A01d *45/16***
**U.S. Cl. 56—27.5** **5 Claims**



Improved apparatus for harvesting growing tobacco leaves from a standing tobacco crop is described. The harvester includes means for orienting the tobacco leaves and maintaining such orientation during and after defoliation until deposition of the leaves in container means provided on the harvester. Improved leaf defoliator elements are provided and devices for separating leaves in the picking swath from those above the picking swath are provided. The harvester is designed such as to reduce leaf damage to a minimum. The harvester also includes improved means for effecting directional control thereof relative to the tobacco plants to still further reduce damage to the tobacco leaves.

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**3,744,225**

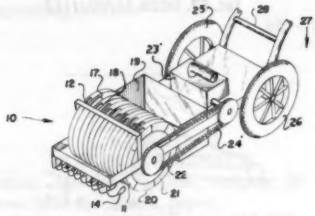
**NUT HARVESTING MACHINE**

**Sam B. Reeves, 2323 Cherry St., Montgomery, Ala.**

**Filed Feb. 14, 1972, Ser. No. 225,966**
**Int. Cl. A01g *19/00***
**U.S. Cl. 56—328 R** **9 Claims**

A nut harvesting machine having about equally spaced flexible wheels laterally aligned, with nut aligning tines extending from the frame anterior to the aligned wheels with narrow tines laterally aligned in front of each of paired end wheels on each end of the aligned plurality of wheels and with in-between narrow tines being in front of every third wheel with

an enlarged tine being arranged in front of and between intermediate paired tines such that in most instances the majority of nuts collected between any two adjacent lateral faces of the wheels are flexible of the wheels outwardly from one another by virtue of at least fewer nuts being collected on the opposite sides of the paired adjacent wheels, and with a collection receptacle being adjacent a posterior side of the aligned wheels and being supported on a framework attached to an axle supporting the aligned wheels, with staggered ejection tines extending downwardly between adjacent wheels in the proximity of the collection receptacle such that nuts of any



two adjacent collection sites between the two consecutive adjacent paired faces of wheels are not concurrently ejected whereby lateral flexing thereby facilitating ejection is possible at substantially all times and points during the ejection movement of the spaced wheels, the respective spaced wheels each including an outer enlarged rim and spaced inwardly therefrom an inner annular enlarged ring joined by a radially extending lateral wall thereby defining a trap space between the outer and inner enlarged areas, and the trap space being divided by radially extending ridges into segmented compartments around the periphery of the lateral face of each wheel.

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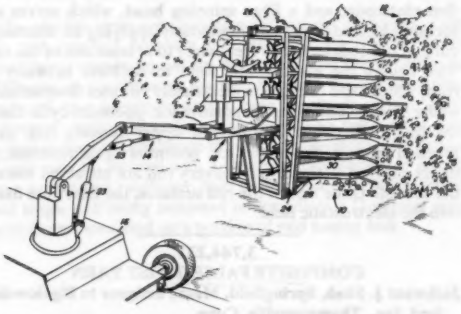
**3,744,226**

## TREE FRUIT PICKING APPARATUS

**Charles C. Granger, 1203 Chestnut St., Henderson, N.C.**

**Filed Apr. 11, 1972, Ser. No. 242,973**
**Int. Cl. A01g *19/00***
**U.S. Cl. 56—328 R** **20 Claims**



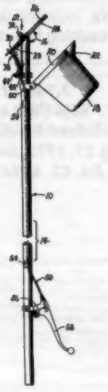
A tree fruit picking apparatus comprising a plurality of rigid support rods affixed to a rotatably driven support frame and diverging outwardly therefrom, each rod carrying several fruit-grasping members each of which defines a fruit-receiving opening to retentively grasp the fruit in its path and free such from its stem. A stationary shield partially surrounds the rotatable support member and is effective to orient the tree branches and also periodically depress the fruit-grasping members and subsequently release them, such that they spring outwardly into the tree branches to grasp the fruits in their paths.

**3,744,227**

## PORTABLE FRUIT HARVESTER

**Fred G. Kerner, 4638 E. Grant Avenue, Fresno, Calif.**

**Filed Sept. 24, 1971, Ser. No. 183,604**
**Int. Cl. A01g *19/08***
**U.S. Cl. 56—335** **5 Claims**



The portable fruit harvesting device disclosed consists of a clipper mounted on the upper end of a pole at an angle with the pole axis so that the clipper is disposed in a generally horizontal plane when the pole axis is tilted to form about a 45° angle with the ground. The clipper has a fixed blade and a movable blade, pivotally connected, and the movable blade is actuated by pivotal movement of an L-shaped lever arm mounted on the pole near the clipper. The L-shaped lever is pivoted by pulling a cable which passes down the center of the pole to the lower end and where it is attached to a squeeze handle. The L-shaped lever arm is resiliently biased to place the movable blade in an open position with respect to the fixed blade, and a fruit catcher is positioned below the clipper to catch the fruit.

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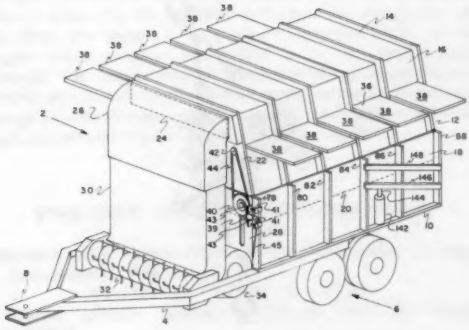
**3,744,228**

## COMPACTING SYSTEM FOR STACKING BULK HAY

**Ezra Cordell Lundahl, Idaho Falls, Idaho, assignor to Ezra C. Lundehl, Inc., Logan, Utah**

**Filed Nov. 4, 1971, Ser. No. 195,709**
**Int. Cl. A01d *85/00***
**U.S. Cl. 56—344** **16 Claims**



A system for stacking bulk hay comprising a hay wagon comprising a receptacle, a compacting head in the form of a

hollow, truncated pyramid mounted for vertical reciprocal movement within said receptacle, to compress hay in the receptacle into a self-containing stack of compacted hay, a pneumatic delivery system for delivering loose hay from the ground into the wagon, accumulator means for permitting delivery of hay into the wagon during the compacting operation, and means for unloading the compacted hay from the wagon. The disclosure includes method, apparatus, and the configuration of the resulting hay stack.

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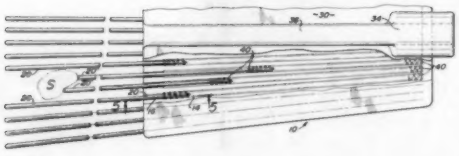
**3,744,229**
**SHRUB RAKE**
**Arthur E. Bull, 8089 Midland Road, Mentor, Ohio**
**Filed May 17, 1972, Ser. No. 254,039**
**Int. Cl. A01d 7/06**
**U.S. Cl. 56—400.17** **16 Claims**



An improved rake especially suited for use in raking among shrubbery is provided. The rake comprises a support means having handle means extending from the support means for manipulation of the rake. A plurality of elongated, generally resilient, spaced apart tines having a first end adapted for raking and a second end, are slidably carried by the support means. The first end of the tines is spaced apart from the support assembly. The rake also includes biasing means for maintaining the tines biased in an outward direction from the support assembly so that, if one of the tines strikes an object during raking, the tine can retract in opposition to the biasing means and the striking of the object does not interfere with the raking action of the remaining tines. When the tine is disengaged from the object such as a stalk of a bush, the biasing means causes the tine to return to its original outward postion.

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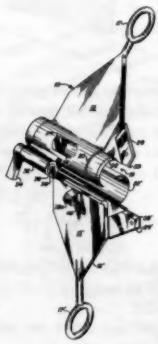
**3,744,230**
**DEVICE FOR REMOVING ARMOR FROM CABLES OR THE LIKE**
**Joe A. Santistevan, Springer, N. Mex., assignor to Clete Brewer Tool Company, Scottsdale, Ariz.**
**Filed Dec. 27, 1971, Ser. No. 212,211**
**Int. Cl. H02g 1/12**
**U.S. Cl. 57—2.3** **10 Claims**



A device for removing armor from wire and cable comprising a pair of hingedly mounted cylindrical sections for receiving between them when separated an armor covered cable and when closed surrounding the cable, and including armor removal members, one on each cylindrical section, to remove or replace the armor from around the cable as the device is moved along and about the axis of the cable.

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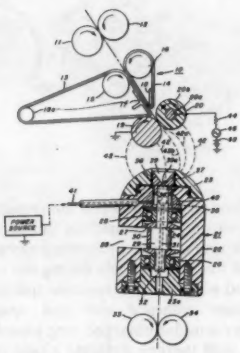
**3,744,231**
**APPARATUS AND METHOD FOR FREEING DRAFTING ROLLS OF ADHERING FIBERS**
**Lawrence E. Tannas, Jr., Orange, and Paul K. York, Fullerton, both of Calif., assignors to Electrospin Corporation, Columbus, Ohio**
**Filed Apr. 19, 1971, Ser. No. 135,313**
**Int. Cl. D01h 11/00, 1/12**
**U.S. Cl. 57—56** **9 Claims**



In an open end textile spinning apparatus having an electrostatic field established between fiber feed rolls and a fiber spinning head by which fiber is attracted from the fiber feed rolls towards the spinning head, the improvement comprising an alternating current source having a predetermined frequency operatively connected to one of the fiber feed rolls to effect rapid oscillation of the electrostatic field and electrical vibration of fibers adhering to the fiber feed rolls. If desired, a d.c. source can be added to the a.c. source to bias the electrostatic field potential lines of force closer to the roll surfaces.

A method of using the apparatus comprises establishing an electrostatic field between the fiber feed rolls, which serve as a first electrode, and a fiber spinning head, which serves as a second electrode, and simultaneously applying an alternating current of predetermined frequency to at least one of the rolls. This causes the electrostatic field to oscillate between the rolls, which field oscillation electrically vibrates fiber adhering to the rolls. In addition, the positive a.c. potential cycle causes the fibers clinging to the cot, or upper delivery roll, to be repelled from it. When the a.c. potential cycle reverses, the fibers clinging to the lower delivery roll are attracted towards the cot roll. Once free of the roll surfaces, the fibers are drawn into the electrostatic field.

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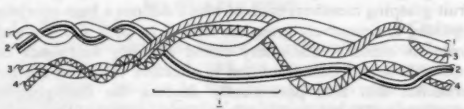
**3,744,232**
**COMPOSITE FALSE-TWIST YARN**
**Jashwant J. Shah, Springfield, Mass., assignor to Bigelow-Sanford, Inc., Thompsonville, Conn.**
**Filed Apr. 5, 1971, Ser. No. 131,369**
**Int. Cl. D03d 15/00; D02g 3/22, 3/28**
**U.S. Cl. 57—140 BY** **12 Claims**



Novel stable, composite false-twist yarn normally made up of three or more singles of similar or different types and/or

sizes or colors of such singles, or made up of plied staple and/or continuous filament constituent yarns (preferably initially formed from at least four yarns in two separately twisted, and cabled,pairs), characterized by the said constituent yarns self-interlocking among themselves at spaced intervals, along the length thereof, and fixing yarn twist zones of substantial length between adjacent twist reversals between zones of opposite yarn twist, said interlocking serving to isolate and maintain the twist integrity in each of said zones and, preferably, also characterized by different circular orientation (clock positions) of the three or more yarn ends at twist reversal points between adjacent opposite twist zones; and to novel fabrics incorporating the same.

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**3,744,233**

## ELECTRIC TIMEPIECE

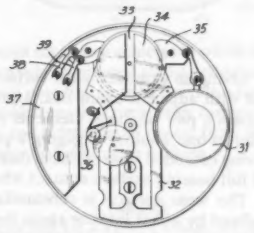
**Yuki Tsuruishi, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Filed Aug. 2, 1971, Ser. No. 168,251**

**Claims priority, application Japan, July 31, 1970, 45/66513; Sept. 30, 1970, 45/84974**

**Int. Cl. G04c** *3/00;* **H02k** *33/00;* **H03d** *5/30*

**U.S. Cl. 58—23 TF** **11 Claims**




An electric timepiece having a driving circuit having a single coil inserted between the collector electrodes of two transistors, one being of the NPN type, the other being the PNP type. A condenser is inserted between the collector electrode of one transistor and a base electrode of the other transistor, and a bias circuit for supplying self-bias is connected to the base electrode of the two transistors. The driving circuit may be utilized with a time standard oscillator including a tuning fork oscillator. Said tuning fork may be U-shaped, said single coil being mounted intermediate a U-shaped magnetic circuit mounted on a portion of said tuning fork.

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**3,744,234**

## ELECTRONIC TIMEPIECE WITH POSITIONABLE ROTOR

**Noriyuki Kamijo, Tatsuno-Machi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

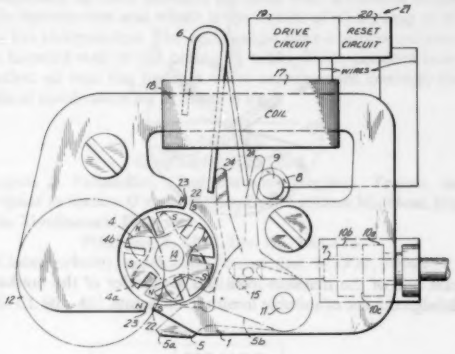
**Filed Feb. 25, 1972, Ser. No. 232,317**

**Claims priority, application Japan, Mar. 3, 1971, 46/10789**

**Int. Cl. G04c** *9/00*

**U.S. Cl. 58—34** **7 Claims**

In an electronic timepiece, the rotor bears, in addition to the usual pinion gear, a cam. Pulling the watch stem outward makes it possible to stop the rotor as well as the second hand of the timepiece which is connected to the rotor, at a preselected position by means of the cam. Pushing the stem inward restarts the rotor. In this way, the second hand can be synchronized with an external time signal. The stator has a plurality of functions, making it possible to reduce the size of such timepieces.

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**3,744,235**

## TIMEPIECE INDICATING TIME BY GENERATED IMAGES IN SETS

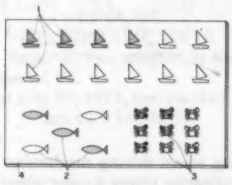
**Shunsei Kratomi, 456 Maegawa, Kanagawa-ken, Odawara-shi, Japan**

**Filed Dec. 6, 1971, Ser. No. 204,845**

**Claims priority, application Japan, Dec. 19, 1970, 45/108586**

**Int. Cl. G04b** *19/30*

**U.S. Cl. 58—50 R** **21 Claims**



A timepiece wherein at least two sets of images are generated on an indicating panel, the number of images present and belonging to the first set indicating the hourly segments in the designation of the time, and the number of images present and belonging to the other one or two sets of images indicating the minute segments in the designation of the time. The images of each set are identified to the set by figure, color, concept, orientation or by any combination thereof. The images may be generated by means of various known means making use, for example, of lamps, lamps and image-printed transparent film, electroluminescent devices, light emissive diodes liquid crystal cells, or the like.

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**3,744,236**

## TIME-PIECE OF IMPROVED READABILITY IN DARKNESS

**Motoki Kishida, Okaya, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Filed Dec. 22, 1971, Ser. No. 210,817**

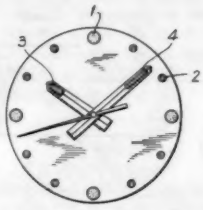
**Claims priority, application Japan, Dec. 24, 1970, 45/129836**

**Int. Cl. G04b** *19/30*

**U.S. Cl. 58—50 A** **5 Claims**

In a time-piece dial wherein the hands as well as one or more of the indicia are marked with luminous paint, readabili-

ty in darkness is improved by using paints luminescing in different colors for each of the two hands and by distinguishing at



least one of the markers from the remainder of the markers through the use of suitable luminescent paints.

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**3,744,237**

**INDICATING WHEEL DRIVING MECHANISMS OF TIMEPIECES**

**Teruo Muto, Kita-ku, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Mar. 1, 1972, Ser. No. 230,572**

**Claims priority, application Japan, Mar. 4, 1971, 46/13861**

**Int. Cl. G04b *19/24***

**U.S. Cl. 58—58** **9 Claims**

In an indicating wheel driving mechanism of a timepiece, comprising an indicating wheel driving wheel and an indicating wheel driving wheel finger for driving said driving wheel, a slot is formed in the driving wheel to define a resilient portion and said indicating wheel driving wheel finger is formed integrally with said resilient portion at a location adjacent the free end thereof, and further means for restricting the degree of bending of said resilient portion is provided, whereby when the driving wheel rotates in the normal direction, the resilient portion is prevented from bending and an indicating wheel is driven by said finger, whereas when the driving wheel rotates in the reverse direction, the resilient portion is allowed to bend and the finger is relieved from restraint by the indicating wheel, providing for rotation of said driving wheel.

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**3,744,238**

**RECTANGULAR WATERTIGHT WATCH CASE**

**Masahide Hirabayashi, and Kanji Miyashita, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

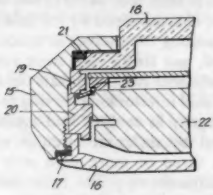
**Filed Sept. 24, 1971, Ser. No. 183,384**

**Claims priority, application Japan, Sept. 26, 1970, 45/94853**

**Int. Cl. G04b *37/08***

**U.S. Cl. 58—90 R** **5 Claims**

A watertight watch case for rectangular watches having a circular threaded aperture in one side thereof dimensioned to receive a circular case back. Gaskets are provided between the watch crystal and said watch case and between portions of the case back and watch case. The watch crystal is engaged



against its respective gasket through intermediate members formed of rigid material positioned between the case back and said watch crystal.

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**3,744,239**

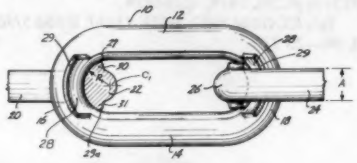
**CHAIN LINK WITH EXTENDED WEAR SURFACE**

**Thomas I'Anson, 4014 Hunts Point Road, Bellevue, Wash.**

**Filed Dec. 20, 1971, Ser. No. 209,695**

**Int. Cl. F16g *15/12***

**U.S. Cl. 59—84** **8 Claims**



A chain link having an extended wear surface for the bearing engagement with adjacent chain link is provided herein. The link comprises a pair of shank elements positioned substantially parallel to one another engaging a pair of rounded end lements having extended wear surfaces thereon. The arcuate ends afford full bearing surface contact when the chain is under tension. The wear surface is substantially toroidal in shape and is defined by a first interior chain link radius taken in the plane of the link and a second radius taken on a plane perpendicular to the plane of the link, the first and second radii being equal. A substantially increased wear surface with an inherent full surface contact interfit with a similarly formed interlinked adjacent chain link results.

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**3,744,240**

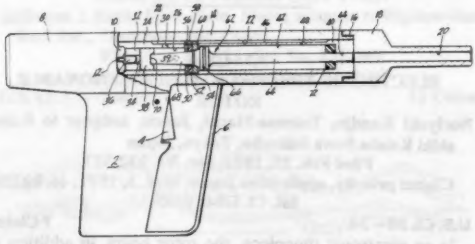
**FASTENER DRIVING TOOL**

**Robert W. Henning, North Haven, and Theodore L. Kucmerosky, Northford, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Nov. 5, 1971, Ser. No. 196,053**

**Int. Cl. F01b *29/08***

**U.S. Cl. 60—26.1** **2 Claims**



A tool for driving fasteners and the like into a supporting surface. The tool utilizes a propellant charge which is ignited

to produce expanding combustion gases that provide energy for driving a ram member against the fastener. The combustion gases are also used to return the ram member from its driven position to its driving position automatically. The ram member is also releasably held in its driving position before the tool is fired.

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**3,744,241**

## VEHICLE GAS TURBINES UNIT WITH RATIO COUPLINGS THEREBETWEEN

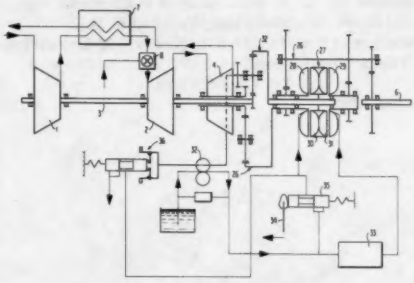
**Dieter Muller, Stuttgart, and Wilhelm Jurisch, Nellingen Kries, Esslingen, both of Germany, assignors to Daimler-Benz, Stuttgart, Germany**

**Filed Mar. 8, 1971, Ser. No. 121,956**

**Claims priority, application Germany, Mar. 6, 1970, P 20 10 581.1**

**Int. Cl. F02c** *7/02*

**U.S. Cl. 60—39.16** **5 Claims**



Gas turbine unit for motor vehicles in which the compressor turbine is selectively connected to the output shaft through a controllable fluid coupling so as to provide a transfer of power to the output shaft from the compressor turbine during partial-load operation and a transfer of power from the output shaft to the compressor turbine during braking.

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**3,744,242**

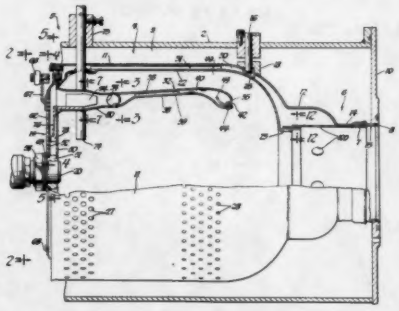
## RECIRCULATING COMBUSTOR

**Richard J. Stettler, and Albert J. Verdouw, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 25, 1972, Ser. No. 220,607**

**Int. Cl. F02c** *3/00*

**U.S. Cl. 60—39.29** **5 Claims**



Combustor structure particularly adapted for supplying motive fluid to a gas turbine engine or the like. A combustion liner is mounted within an inner casing, the two defining between them a recirculation duct for combustion products. The inner casing is mounted within an outer casing, these two defining between them a dilution air duct in which the dilution air is heated while cooling the recirculating combustion products. The combustion liner wall is double and defines combustion air duct between the walls with a Coanda nozzle at its downstream end which is the nozzle of a jet pump to effect the recirculation. The combustion liner is supported from the forward wall of the casing by tubes which conduct combustion air into the liner. A valve arrangement controls the ratio of combustion air to dilution air.

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**3,744,243**

## CONTROL SYSTEM

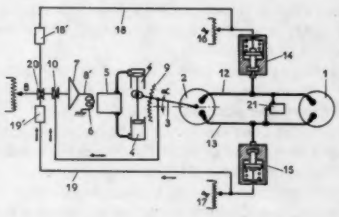
**Jacques J. Faisandier, Chatillon sous Bagneux, France, assignor to Societe D'Applications Des Machines Matrices, Issy les Moulineaux, France**

**Filed Jan. 4, 1971, Ser. No. 103,476**

**Claims priority, application France, Jan. 9, 1970, 7000970**

**Int. Cl. F15b** *15/18*

**U.S. Cl. 60—431** **8 Claims**



An electro hydraulic control system wherein the capacity of a variable pump is automatically controlled in response to the pressure in the conduits which couple the pump to a fluid driven motor. Signals commensurate with pressure are generated and fed back to a control signal generating means which adjusts pump capacity via a servovalve.

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**3,744,244**

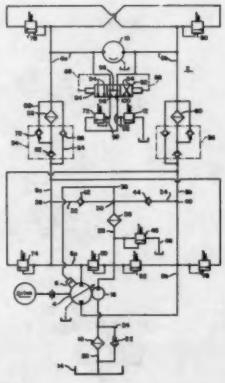
## HYDROSTATIC DRIVE

**Jon R. Swoager, Imperial, Pa., assignor to Automation Equipment, Inc., Imperial, Pa.**

**Filed July 30, 1971, Ser. No. 167,580**

**Int. Cl. F15b** *15/18*

**U.S. Cl. 60—454** **3 Claims**

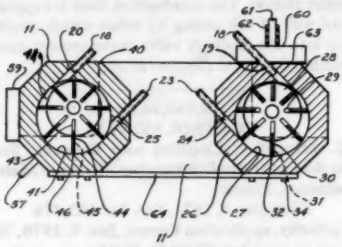


A control system for a closed circuit hydrostatic drive including means for positive filtration of fluid replenishing fluid losses in the closed circuit and means for filtering fluid flowing in the closed circuit. The system provides valves for relieving excessive pressure generated within the closed circuit and the replenishment system.

### 3,744,245
### CLOSED CYCLE ROTARY ENGINE SYSTEM

Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y.

Filed June 21, 1971, Ser. No. 154,759
Int. Cl. F01k *25/00, 19/10*
U.S. Cl. 60—95 6 Claims



The closed cycle rotary engine system consists of a rotary expander stage and rotary pump stage, which are driven together at a 1 to 1.+ ratio.

The fluid/vapor closed loop is formed to enter and leave the two rotary stages tangentially so that a minimum number of simplified rotary components are required.

Multiple boiler coils are located above and around the two rotary stages to heat an organic fluid working medium which expands in a vapor state to drive the expander stage rotor.

Multiple condenser coils are located below and in front of the two rotary stages which cools the vapor to a liquid state which is then drawn into the rotary pump stage for further cooling and transfer.

Supplementary heating and cooling techniques are adopted to enable a reduction in the total size and volume of the rotary engine system.

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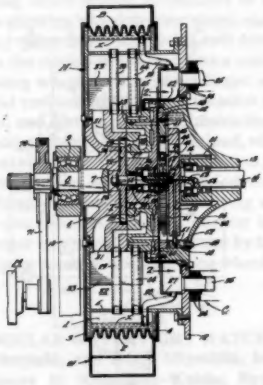
### 3,744,246
### ROTARY CLOSED RANKINE CYCLE ENGINE WITH INTERNAL LUBRICATING SYSTEM

William A. Doerner, Wilmington, Del., assignor to E. I. du Pont Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1972, Ser. No. 231,232
Int. Cl. F01k *11/04*
U.S. Cl. 60—95 7 Claims



A rotary closed Rankine cycle engine comprising a housing rotatable about its axis and including an annular boiler adapted to contain a liquid power fluid. The housing is subdivided into separate expander and lubricant compartments. The expander is actuated by pressure vapor power fluid generated in the boiler and rotationally drives a coaxial shaft associated with other moving parts. An annular sump is provided in the lubricant compartment adapted to contain an annular lubricant bath of predetermined radial depth. Nonrotatable pump means is provided in the lubricant compartment operable by rotation of the housing relative to the pump to pump lubricant from the bath to the shaft and associated moving parts to lubricate the same. Heating means is provided for vaporizing excess power fluid that migrates along the shaft from the expander compartment to the lubricant compartment thereby raising the vapor pressure in the lubricant compartment to the vapor pressure in the expander compartment and balancing the pressure along the shaft to prevent further migration of power fluid from the expander compartment to the lubricant compartment.

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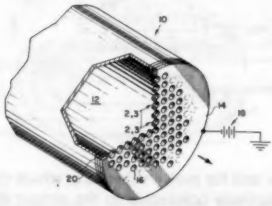
### 3,744,247
### SINGLE GRID ACCELERATOR FOR AN ION THRUSTOR

Paul M. Margosian, Roslindale, Mass., and Shigeo Nakanishi, Berea, Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 758,540, Sept. 9, 1968, abandoned.
This application Sept. 14, 1971, Ser. No. 180,473
Int. Cl. F03h *5/00*
U.S. Cl. 60—202 3 Claims



A single grid accelerator system for an ion thrustor. A layer of dielectric material is interposed between this metal grid and the chamber containing an ionized propellant for protecting the grid against sputtering erosion.

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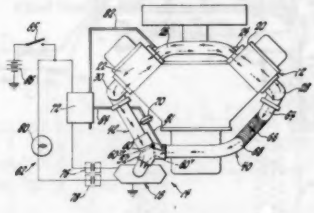
### 3,744,248
### CATALYTIC CONVERTOR TEMPERATURE CONTROL SYSTEM

Michael R. Foster, Goodrich; John I. Jalbing, Millington, both of Mich., and Lester E. Patterson, deceased, Grand Blanc, Mich. (by Marie L. Patterson, administratrix), assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 10, 1972, Ser. No. 242,583
Int. Cl. F02b *75/10*
U.S. Cl. 60—286 3 Claims



A temperature control system for a catalytic convertor in an exhaust emission system for an internal combustion engine includes a cooling loop for lowering the exhaust gas temperature to prevent overheating of the convertor. The system includes a crossover passage in the engine intake manifold and a pair of conduits separately connected to the exhaust manifolds and

commonly connected at a Y-pipe including a convertor temperature responsive diverter valve that is operable to selectively route the gases through the conduits. One conduit has a relatively short length wherein the exhaust gases experience a small temperature loss and the other conduit or cooling loop has a longer length of pipe including a section of corrugated tubing having an increased heat transfer area wherein the exhaust gases experience a large temperature loss. During warmup and normal operating conditions the valve routes the exhaust gases through the crossover passage and the shorter conduit. When the convertor exceeds a predetermined temperature, the valve routes the exhaust gases through the crossover passage and the longer conduit thereby lowering exhaust gas temperature to provide a lower inlet temperature at the convertor and maintain the temperature of the convertor within a predetermined range.

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**3,744,249**

**COMBUSTION ENGINE DEVICE**

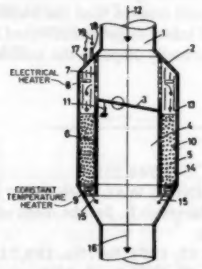
**Paul August, Arabellastrasse 5, D-8000 Munich 81, Germany**

**Filed Sept. 16, 1970, Ser. No. 72,670**

**Claims priority, application Germany, Sept. 16, 1969, P 19 46 862.3; Aug. 14, 1970, P 20 40 584.9**

**Int. Cl. F01h *3/14***

**U.S. Cl. 60—286** **8 Claims**




A combustion engine apparatus for use in the exhaust system of an engine for reducing the non-burned and partially burned constituents in the exhaust gas, a coaxial annular reaction chamber having longitudinally arranged heater chamber and an after-combustion chamber having catalytic material therein, a spring-loaded throttle valve eccentrically mounted within the exhaust system intermediate the ends of the coaxial chamber, being maintained essentially closed until excessively high rates of combustion and resulting dynamic pressure open the valve.

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**3,744,250**

**AFTER-BURNER FOR AN INTERNAL COMBUSTION ENGINE**

**Yasushi Tanasawa, Miyagi; Tokuta Inoue, Shizuoka; Hidetaka Nohira, Shizuoka, and Mitsumasa Yamada, Shizuoka, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

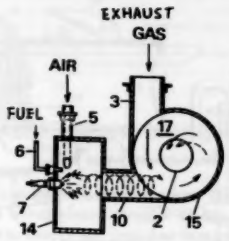
**Filed Feb. 17, 1971, Ser. No. 116,028**

**Claims priority, application Japan, Feb. 21, 1970, 45/14893**

**Int. Cl. F01n *3/14***

**U.S. Cl. 60—303** **1 Claim**

An after-burner for an internal combustion engine comprising a vortex combustion chamber producing flames in spiral form or rotary columnar form, a reactor, a flame inlet port for maintaining said vortex combustion chamber and said reactor




in communication with each other, and an exhaust gas inlet pipe connected to said reactor for introducing exhaust gas of the engine thereinto.

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**3,744,251**

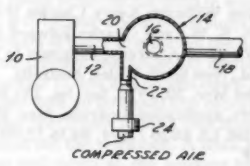
**ENGINE EMISSION CONTROL DEVICE**

**Charles E. Hallum, Irvine, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.**

**Filed May 1, 1972, Ser. No. 249,610**

**Int. Cl. F01n *3/10***

**U.S. Cl. 60—324** **8 Claims**




The engine discharges exhaust gases into a vortex chamber that either provides essentially no resistance to discharge of the flow or variably increases the impedance or resistance to flow as a function of the entry of flow from a radial to a tangential direction, the tangential direction applying centrifugal force to the flow and creating turbulance and thus increasing resistance to discharge; the means for switching the flow from a radial to a tangential direction in one instance consisting of a source of compressed air provided by the engine that also combines with the unburned hydrocarbons and carbon monoxide elements to reduce them to less harmful forms; or alternatively, fluidic diverter valves that automatically switch the flow from a stable direction to an alternate direction by means of an electrically actuated tab or air signal force.

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**3,744,252**

**CLOSED MOTIVE POWER SYSTEM UTILIZING COMPRESSED FLUIDS**

**Eber H. Van Valkinburgh, Reno, Nev., assignor to Endless Power Corporation, Inc., Reno, Nev.**

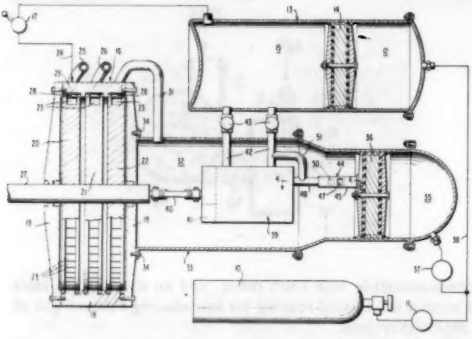
**Filed Nov. 11, 1971, Ser. No. 197,667**

**Int. Cl. F03b *1/00*; F15b *1/02***

**U.S. Cl. 60—468** **12 Claims**

Stored energy in a compressed elastic fluid is utilized in a controlled manner to pressurize an inelastic fluid and to maintain such pressurization. The pressurized inelastic fluid is

throttled to the impeller of a prime mover. A portion only of the output energy from the prime mover is utilized to operate



a circulating means for the inelastic fluid so as to maintain a nearly constant volumetric balance in the system.

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**3,744,253**
**OIL SPILL BOOM**

**Patrick Yelverton Williams; Kerry Charles Williams, both of Castlecrag, N. S. W., and Charles Edward Heath, Caringbah, N. S. W., all of Australia, assignors to Stamford Australia Pty. Ltd., New South Wales, Australia**

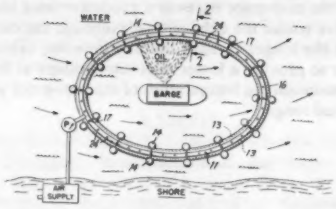
**Filed Mar. 20, 1972, Ser. No. 235,901**
**Claims priority, application Australia, Mar. 29, 1971, 4444**
**Int. Cl. E026** *15/04*; **B636** *35/00*
**U.S. Cl. 61—1 F** **4 Claims**

An oil spill boom to restrain the passage past the boom of oil spilt onto water. The boom comprises a plurality of alignable interconnectable floats, a continuous screen barrier extending through, between, above and below the floats with the part below the floats formed of two walls spread apart at the bottom to provide an open bottom water ballast chamber, props and stays to support the screen barrier erected.

**3,744,254**
**PROCESS AND APPARATUS FOR CONTAINMENT OF AQUEOUS POLLUTANTS**

**Richard P. Fennelly, 33-23 147th St., Flushing, N.Y.**

**Filed May 17, 1972, Ser. No. 253,981**
**Int. Cl. E02b** *15/04*
**U.S. Cl. 61—1** **9 Claims**




An air or bubble barrier which can be used to contain and deflect aqueous pollutants, such as oil, flotsam and the like, is confined within its desired line of travel by placing a mesh material between at least one point adjacent the generation point of the gas below the surface of the water and a point which is adjacent the surface of the water. The mesh material can be ordinary wire screening used in household screens. The use of the mesh material insures that the bubble barrier will follow a desired line of travel largely unaffected by currents or eddies which would normally disperse the bubble stream to an undesirable extent.

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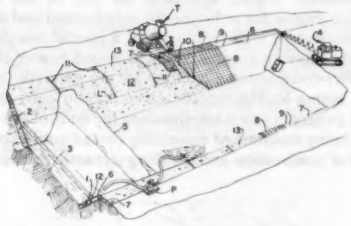
**3,744,255**
**CANAL BANK RETAINING WALL MEANS AND METHOD**

**Paul R. Jacobs, and Marcellus L. Jacobs, both of Route 3, Box 722, Fort Myers, Fla.**

**Filed Oct. 13, 1971, Ser. No. 188,713**
**Int. Cl. E02b** *5/00, 5/08*
**U.S. Cl. 61—7** **20 Claims**



A canal bank retaining wall means and method of making same comprising, an elongate wall poured in place on an earthen canal bank immediately after digging said canal, said retaining wall having expansion joint means therein at spaced intervals along the length thereof for enabling expansion and contraction of said wall upon temperature changes in the surrounding environment. If desired, removable sections may be provided in said retaining wall so that said sections may be removed after the canal is constructed in order that a boat slip or a dock the like may be economically built in said retaining wall. Also, the surface of the retaining wall exposed to the water in said canal may be roughened to provide an ecologically better environment for marine life and other organisms, if desired.

3,744,256

## FLUID TRANSFER

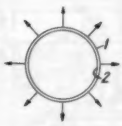
Malcolm Carnie Cobb, and Trevor Raymond White, both of c/o ICI Fibres Limited, Pontypool, England

Continuation-in-part of Ser. No. 869,353, Oct. 24, 1969. This application Mar. 20, 1972, Ser. No. 236,181

Claims priority, application Great Britain, Oct. 31, 1968, 51,733/68

Int. Cl. E02b *13/00*

U.S. Cl. 61—13 8 Claims



Methods and systems of irrigation in which fluid is distributed via buried porous conduits to utilize conduits of nonwoven fibrous material the porosity of which varies along the length of the conduits.

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3,744,257

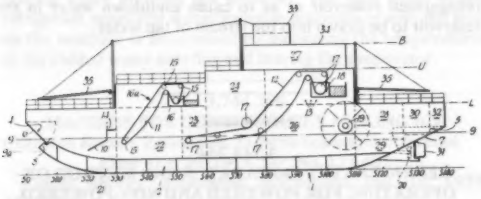
## WATER-SURFACE CLEANSING SHIP

William Frank Spanner, 4, Albion Terrace, The Common, Patchway, Bristol BS12 6AN, Gloucestershire, England

Filed Dec. 1, 1971, Ser. No. 203,786

Int. Cl. E02b *17/00, 15/04*

U.S. Cl. 61—46.5 10 Claims



A water-surface cleansing ship having a hull provided with a channel extending longitudinally through the hull. At least surface water to be cleansed is caused to flow in operation of the ship, through the channel, by motion of the ship either self-propelled or towed and/or by flow causing means such as a paddle wheel in the channel. The ship has means for removing and recovering contaminants such as oil from water flowing through the channel. The contaminant removing and recovering means preferably include a mesh grill, one or more conveyor belt and tank assemblies, and detergent sprays.

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3,744,258

## METHOD AND APPARATUS FOR CONNECTING A PIPELINE TERMINUS TO AN UNDERWATER INSTALLATION

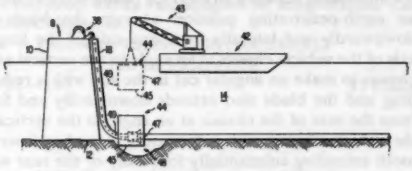
Joe C. Lochridge, and William R. Rochelle, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 817,495, April 18, 1969. This application Nov. 3, 1970, Ser. No. 86,482

Int. Cl. F16l *25/00*; B21d *11/02*

U.S. Cl. 61—72.3 2 Claims

A method and apparatus for connecting a pipeline to an underwater installation wherein a conduit of the underwater installation is provided with a receiving funnel and a drawline is threaded through that conduit and through the funnel. The drawline is connected to pipeline terminus and is tensioned to draw the pipeline terminus through the water and into the funnel. During this tensioning the pipeline is buoyantly supported and the buoyant support is slidably moved with respect to the pipeline, the pipeline and underwater installation are subsequently secured in fluid communication. Drawline tension may be balanced by applying tension to the pipeline in a direction opposite to that of the drawline tension.



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3,744,259

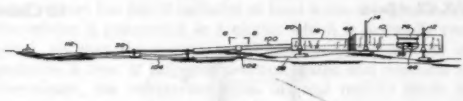
## PIPE-LAYING MACHINE

Allen W. Wagley, DeRidder, La., assignor to Atlantic Richfield Company, New York, N.Y., a part interest

Filed Mar. 19, 1971, Ser. No. 126,142

Int. Cl. F16l *1/00*; B60g *9/00*

U.S. Cl. 61—72.5 21 Claims



This machine is designed for laying large-diameter pipe over rough terrain in extreme climates. For example, it was designed to lay 48" steel pipe from the Alaskan North Slope across the mountains to the Gulf of Alaska. An enclosed, elongated vehicle or house straddles the ditch in which (or piers on which) the pipe is to be laid. The house is supported at each of the corners by pillars in order to maintain the house level. The pipe is supported through the house on carriages which are free to float from side to side and up and down. Therefore, the pipe is constructed with all its bends and crooks over the support position and the house follows the ditch, providing a warm environment for the workmen. A deck section follows the carriages up and down so the workers have a platform which is always maintained at a fixed position relative to the pipe. As the vehicle moves forward out from under the pipe, the pipe is lowered by a series of trailing roller jacks. A sleeve surrounds the pipe as it leaves the vehicle so the temperature of the pipe is gradually changed from the relatively warm temperature to the frigid arctic temperature.

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3,744,260

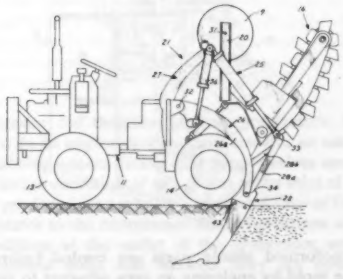
## CABLE LAYING APPARATUS WITH OFF-CENTER INCLINED EARTH-PENETRATING BLADE

Frank J. Lucero, 2769 S. Oakland Circle, W., Denver, Colo.

Filed Oct. 29, 1971, Ser. No. 193,835

Int. Cl. F16l *1/00*; E02f *5/02*; A01b *49/02*

U.S. Cl. 61—72.6 19 Claims



An earth-penetrating blade is mounted to one side of the longitudinal axis of a vehicle chassis and out of the way of

other auxiliary equipment on the chassis for alternate operation of blade or the equipment on the same chassis. The blade is mounted at the rear of the parallelogram-type support frame for movement between an elevated position above the soil and an earth-penetrating position wherein the blade extends downwardly and laterally from one side of the longitudinal axis of the vehicle chassis at an angle to the vertical axis of the chassis to make an angular cut in the soil with a reduction in drag and the blade also extends downwardly and forwardly from the rear of the chassis at an angle to the vertical axis of the vehicle chassis with a forwardly extending lower digger tooth extending substantially forwardly of the rear wheels to distribute the pull-down forces of the blade on the vehicle more evenly between each of the vehicle wheels. Hydraulic cylinders are operatively associated with the support frame to move the blade between the elevated position and earth-penetrating position and to adjust the angle the toe section of the digger tooth makes with the horizontal.

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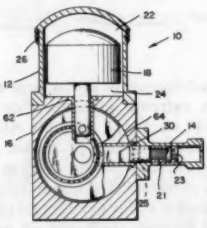
**3,744,261**

## CRYOGENIC REFRIGERATOR

George P. Lagodmos, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 16, 1972, Ser. No. 235,170
Int. Cl. F25b *9/00*
U.S. Cl. 62—6 10 Claims



The substantially ambient temperature volume of the Vuilleumier refrigerator, which comprises a crank volume, is reduced to a minimum by employing a cylindrical disc in a cylindrical crank cavity, with a pin carried on eccentric race on the disc. A slider carries the pin and drives the piston. By this construction, metal occupies most of the crank volume.

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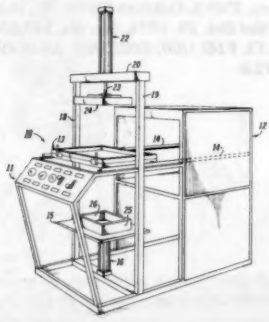
**3,744,262**

## METHOD FOR COOLING THERMOFORMED PLASTIC PARTS

Robert N. Bose, 1015 Naperville Road, Wheaton, Ill.

Filed June 30, 1971, Ser. No. 158,401
Int. Cl. F25d *25/00*
U.S. Cl. 62—62 3 Claims



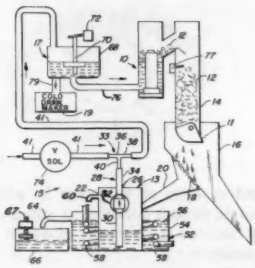
Thermoformed plastic parts are cooled before removal from the mold by enclosing an area adjacent to the part and introducing liquid carbon dioxide to the confined area through metering orifices.

**3,744,263**

## RECIRCULATION SYSTEM FOR MELTDOWN WATER FROM AN ICE STORAGE COMPARTMENT

Raymond J. Franck, 56 Walpole Road, and Dewey A. Corley, 4198 Gantir Drive, both of Elk Grove Village, Ill.

Filed Nov. 9, 1970, Ser. No. 87,892
Int. Cl. F25c *5/18*
U.S. Cl. 62—98 20 Claims



Meltdown water from an ice storage compartment is conveyed to a refrigerated reservoir and stored at a lowered temperature until such time as water is withdrawn from the reservoir for making more ice or for other purposes. The meltdown water is withdrawn by means of a venturi arrangement, wherein fresh tap water flowing through an inlet conduit passes through a venturi device connected to the outlet of the refrigerated reservoir so as to cause meltdown water in the reservoir to be drawn into the stream of tap water.

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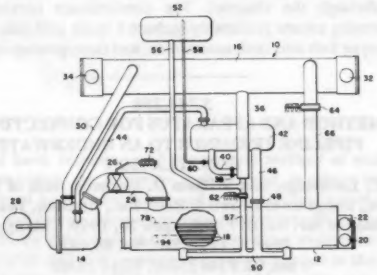
**3,744,264**

## REFRIGERATION APPARATUS AND METHOD OF OPERATING FOR POWERED AND NON-POWERED COOLING MODES

Chester D. Ware, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Mar. 28, 1972, Ser. No. 238,811
Int. Cl. F25b *1/00*
U.S. Cl. 62—115 13 Claims

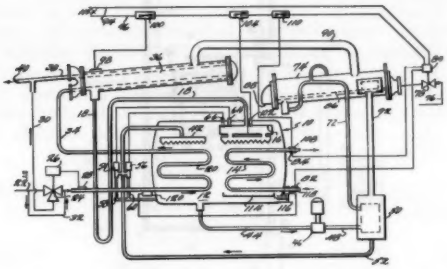


This specification discloses the method and apparatus for operating a refrigeration system in both powered and non-powered (free cooling) modes of operation including the method and apparatus for rapidly converting from one mode to the other.

## 3,744,265
## CONTROL CIRCUITS FOR ABSORPTION REFRIGERATION MACHINE

Fred W. Bawel, Boonville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.

Division of Ser. No. 16,021, March 3, 1970, Pat. No. 3,613,390. This application Aug. 11, 1971, Ser. No. 170,775
Int. Cl. F25b *15/06*
U.S. Cl. 62—141 2 Claims

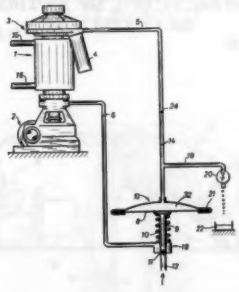


In an absorption refrigerating machine, such as a salt absorption type of machine, control of the temperature in the refrigerant flash chamber is effected by bypassing absorbent around the absorber when the chamber temperature approaches the freezing temperature. Concentration of the salt solution is controlled by withdrawing refrigerant from the circuit into a chamber and dumping the refrigerant into the absorber circuit when there is a drop in the temperature of the cooling water entering the absorber. The heat input to the refrigerant generator is controlled in accordance with the load on the machine as determined by measuring the temperatures of the chilled water entering and leaving the evaporator.

## 3,744,266
## MACHINE FOR CONTINUOUSLY MAKING ICE

Christian Beusch, Zollstrasse, Fl-9494 Schaan, Switzerland

Filed Aug. 20, 1971, Ser. No. 173,431
Claims priority, application Switzerland, Dec. 14, 1970, 18463/70
Int. Cl. F25c *1/14*
U.S. Cl. 62—189 6 Claims

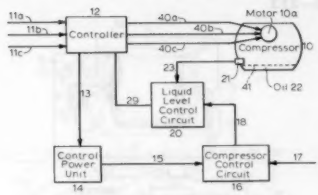


Machine for continuously making ice cubes, with a rotating screw conveyor which continuously scrapes ice from the inner surface of a double walled cooling jacket and discharges the ice by extruding it through an upper perforated plate. The ice extruded in such way is cut off by a scraper blade, producing ice cubes which are ejected from the machine. The rate of flow of feedwater to the ice maker is controlled in dependence on the rate of flow of overflow water leaving the ice maker. The overflow water forms a water column from which water is drained away at a constant rate. The height of the static water column influences a diaphragm valve which controls the rate of flow of feedwater fed to the ice maker.

## 3,744,267
## LIQUID LEVEL PROTECTION SYSTEM FOR REFRIGERATION COMPRESSOR

Dean K. Norbeck, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 15, 1972, Ser. No. 234,822
Int. Cl. F25b *47/00*
U.S. Cl. 62—193 11 Claims

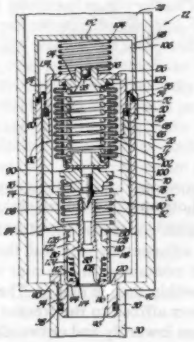



A control circuit for protecting a refrigration system against a high liquid level condition includes a thermistor. The thermistor has a negative temperature coefficient of resistivity and is mounted in a housing wall above the normal liquid level, where the liquid includes at least some refrigerant. The thermistor is connected in a circuit which is normally energized, so that the thermistor is self-energized and its impedance is low. If refrigerant accumulates and contacts the thermistor, the refrigerant boils off and rapidly cools the thermistor, increasing its impedance. This increase in impedance provides an increased voltage drop across the thermistor which is used to trigger a semiconductor switch, which in turn interrupts the circuit to the electrical motor.

## 3,744,268
## SUCTION THROTTLING VALVE FOR AUTOMOTIVE REFRIGERANT SYSTEM

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1972, Ser. No. 231,876
Int. Cl. F25b *41/04*
U.S. Cl. 62—217 4 Claims



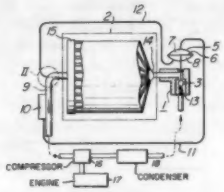
A controller for throttling the suction return from an evaporator to an engine driven compressor in an automotive air conditioning system having dual poppet valves operated in response to the condition of refrigerant at the inlet of the controller to produce a first relatively restricted flow of fluid from the evaporator to the compressor under conditions where the fluid conditions at the outlet of the evaporator are near a desired control point and wherein they are operated to produce a relatively unrestricted flow from the evaporator to the compressor when the evaporator has a high heat load imposed thereon.

**3,744,269**

## FLOW CONTROL DEVICE

Yoichiro Oshima; Seigo Miyamoto, and Manabu Matumoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1971, Ser. No. 125,944
Claims priority, application Japan, Mar. 23, 1970, 45/23513
Int. Cl. F25b *41/04*
U.S. Cl. 62—212 4 Claims




A flow control device for controlling the flow of refrigerant passing through an evaporator of a car cooler cycle or the like in which the difference between changes of the pressure and temperature of refrigerant at the outlet of the evaporator is converted into the displacement of a diaphragm in response to which the opening of an expansion valve is controlled, both of the static and dynamic pressures of refrigerant at the outlet of the evaporator are used as said pressure to actuate the diaphragm.

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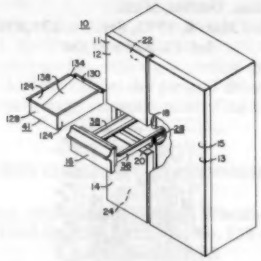
**3,744,270**

## ICE MAKER AND ICE SERVICE DRAWER ARRANGEMENT

Charles A. Wilcox, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1971, Ser. No. 194,588
Int. Cl. F25c *5/18*
U.S. Cl. 62—344 2 Claims



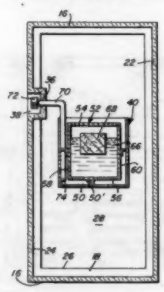
The invention provides an ice maker and ice receiving and dispensing drawer combination which is disposed within a freezer or the freezer compartment of a refrigerator, with the ice maker placed adjacent the rear wall thereof so that cool air moving in a duct contained in the rear wall may efficiently freeze the water within the ice maker. The receiving drawer is disposed on runners affixed to the freezer compartment inner walls for movement inwardly and outwardly, and extends from front to back a sufficient distance so that its rearward portion is disposed under the dispensing means for the ice maker unit while its forward portion is at the front of the freezer refrigerator. The ice maker drawer includes a bottom member which is slanted from rear to front so that ice deposited within the receiving drawer is urged by gravity towards the front portion of the drawer for easy access by the user. The forward portion of the receiving drawer includes a front piece arrangement which forms a front panel of a refrigerator or freezer of which it is a part. The receptacle portion for the drawer is removable from the remainder of the drawer so that it may be utilized as a separate dispensing means when situated outwardly of the refrigerator or freezer.

**3,744,271**

## HOLDOVER COLD PLATE COOLING UNIT

Paul R. Franklin, Jr., 5211 W. Beaver St., Jacksonville, Fla.

Filed Mar. 31, 1972, Ser. No. 240,047
Int. Cl. F25d *11/00*
U.S. Cl. 62—430 1 Claim



A cooling unit for and to be mounted within a container to be maintained refrigerated. The unit includes an open top tank having a closed hollow body removably positioned within the tank with general equal spacing between the inner surfaces of the tank walls and the opposing outer surfaces of the hollow body, the latter being somewhat less than completely filled with eutectic solution. The tank includes structure for mounting within the container to be refrigerated and is adapted to have liquid nitrogen discharged thereinto in sufficient quantity to lower the temperature of the hollow body and the eutectic solution disposed therein to the freezing point of the eutectic solution before all of the liquid nitrogen placed within the tank vaporizes.

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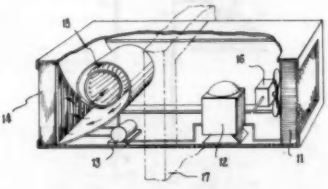
**3,744,272**

## REFRIGERATION SYSTEM WITH HEAT EXCHANGER EMPLOYING EUTECTIC

Oscar Oldberg, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1971, Ser. No. 210,661
Int. Cl. F25d *11/04*
U.S. Cl. 62—439 5 Claims

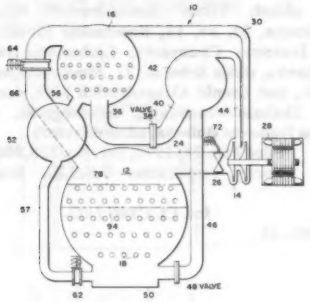


This invention is a unique environmental control unit of the vapor-compression system type which incorporates a dual operation heat exchanger of the circulated air variety. The heat exchanger embodies spaced plate containers of eutectic material with evaporator coils effectively embedded therein such that air circulation and the normal evaporation process is not unduly impeded during regular operation and holdover cooling is provided when electric power for the compressor fails. In accordance with the invention, a separately powered air circulation means is provided.

## 3,744,273
## REFRIGERATION APPARATUS AND METHOD OF OPERATING FOR POWERED AND NONPOWERED COOLING MODES

Chester D. Ware, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Mar. 27, 1972, Ser. No. 238,410
Int. Cl. F25b *1/00*
U.S. Cl. 62—498 5 Claims

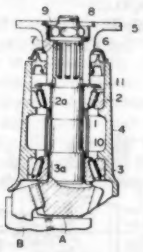


This specification discloses the method and apparatus for operating a refrigeration system in both powered and nonpowered (free cooling) modes of operation including the method and apparatus for rapidly converting from one mode to the other.

## 3,744,274
## DEVICE FOR CONNECTING POWER TRANSMISSION MEMBER OF DRIVE SHAFT

Setsuro Sekiya, Toyota; Motonobu Ando, Okazaki; Yoshihiro Nunotaki, Toyota; Shogo Kato, Toyota, and Yoshiro Jikihara, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 27, 1971, Ser. No. 166,343
Claims priority, application Japan, July 29, 1970, 45/66012
Int. Cl. F16d *11/23*
U.S. Cl. 64—30 C 3 Claims

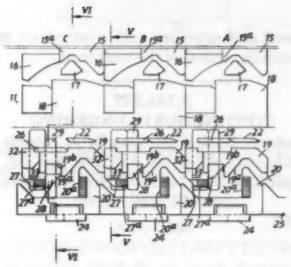


The present invention relates to a frictional connection arrangement between a drive shaft and a prime mover connected to rotate the drive shaft. The frictional connection arrangement is characterized by a surface having a low coefficient of friction and prevents noise due to drive slippage which occurs when the torque on the drive shaft exceeds a predetermined amount.

## 3,744,275
## PATTERNING MECHANISM FOR MULTI-FEED CIRCULAR KNITTING MACHINES AND TO A METHOD OF KNITTING ON THE SAME

Ronald Harris, Leicester, England, assignor to Stibbe Machinery Limited, Leicester, England

Filed Mar. 22, 1971, Ser. No. 126,720
Int. Cl. D04b *15/68, 15/14*
U.S. Cl. 66—42 9 Claims



A multi-feed circular knitting machine capable of producing multi-color jacquard patterns and "blister" fabrics and wherein the feeds are arranged in successive groups each of the same number. The section of the cam system at each of relevant feeds includes a jack raising cam acting upon operating butts of pivoted needle-actuating jacks left with their butts in radially outward positions as the result of selective action upon the jacks by pattern unit in advance of the jack raising cam; a portion of cam track at an intermediate height following the jack raising cam and into which the operating butts of the said jacks are directed by a downwardly sloping cam face; a re-setting cam at the leading end of said portion of cam track for outwardly moving the remaining jacks previously moved inwardly by the selective action of the pattern unit; and, following the re-setting cam, a depressor cam automatically acting on the outer ends of the operating butts of the outwardly moved jacks at the aforesaid intermediate height or at a low height to depress these butts into the cylinder.

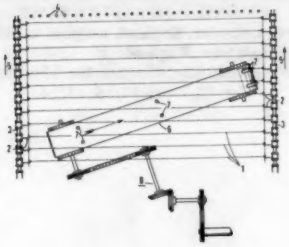
## 3,744,276
## KNITTING AND WEAVING MACHINE

Adolf Hagel, and Helmut Sell, both of Bavaria, Germany, assignors to LIBA Maschinenfabrik G.m.b.H., Bayern, Germany

Filed Dec. 15, 1971, Ser. No. 208,128
Claims priority, application Germany, Dec. 24, 1970, P 20 63 696.8
Int. Cl. D04b *23/06, 23/08, 23/10*
U.S. Cl. 66—84 R 2 Claims

Means are provided for keeping a plurality of weft threads of knitting and weaving machines separated so that they can-

not cling or cohere and form defective warp knit goods. An endless moving belt is arranged obliquely across the width of



the readied weft and provided with pins whose movement is coordinated with the speed of the weft feed.

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**3,744,277**

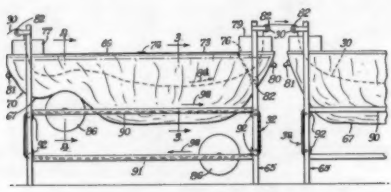
**CONTINUOUS LAUNDERING**

**Paulette Grantham, 1830 White Oak Drive, Menlo Park, Calif. 94025**

**Continuation-in-part of Ser. No. 510,596, Nov. 30, 1965. This application Dec. 16, 1970, Ser. No. 90,167**

**Int. Cl. B05c *3/10***

**U.S. Cl. 68—53** **5 Claims**



A continuous washing apparatus made up of one or more units, each unit including a flexible tube or bag through which the goods to be laundered are moved in a continuous operation, the flexible tube being flexed so as to agitate the water therein and the goods in the water, in the passage of the goods through the tube, so as to produce a washing action; when a plurality of such units are used, the goods are removed from one such unit to the next for successive and related steps in the laundering operation such as washing, rinsing etc.; it also includes a gripping means for removing the goods from the exit end of the unit, and when a plurality of units are used in succession, utilizing the gripping means for depositing the goods into the next unit.

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**3,744,278**

**LEATHER SHAVING MACHINE**

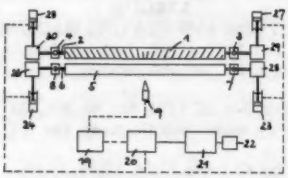
**Gerhard Richter, Weiherweg 13, and Peter Poppel, Muhlhausener Str. 21, both of 84 Regensburg, Germany**

**Filed Sept. 27, 1971, Ser. No. 183,829**

**Claims priority, application Germany, Oct. 15, 1970, P 20 50 539.9**

**Int. Cl. C14b *1/06***

**U.S. Cl. 69—42** **3 Claims**



Leather shaving machine, having companion shaving and counter rolls supported in bearings and tending to yield in operational bending deflection to leather passing between them, and hydraulically operated stress bearings for the rolls spaced from the support bearings and operable to apply to the rolls variable bending stresses to counter and cancel out operational bending deflection thereof.

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**3,744,279**

**PELT FLESHING MACHINE**

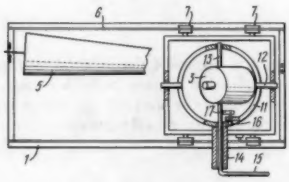
**Jury Vasilievich Pavlov, Ramensky raion, Rodniki, Trudovaya ulitsa, 12; Alexandr Alexeevich Petrov, Ramensky raion Rodniki, ulitsa B. Uchitelskaya, 9 kv. 55, both of Moskovskaya oblast; Viktor Alexandrovich Nikolsky, ulitsa Fabrichnaya, 21, kv. 12, Ramenskoe Moskovskoi oblasti; Raisa Ivanovna Chunyaeva, Ljuberetski raion, poselok Malakhovka, ultisa Schorsa, 21, Moskovskaya oblast, all of U.S.S.R., and Leonid Alexandrovich Filin, deceased, late of ulitsa, Zheleznodorozhnaya,, Krasnogorsk, U.S.S.R. (by Svetlana Ivanovna Bulaeva, administrator)**

**Filed Feb. 24, 1972, Ser. No. 228,886**

**Claims priority, application U.S.S.R., Mar. 2, 1971, 1622318**

**Int. Cl. C14b *1/02***

**U.S. Cl. 69—46** **2 Claims**



A pelt fleshing machine is disclosed which is used in preliminary processing of peltries.

The device comprises an axially rotatable conical pelt holder installed in frame supports and a carriage with an electric motor whose output shaft mounts a cutting tool whose cutters are formed by tensioned strings. The electric motor with the cutting tool is installed on the carriage with a provision for turning relative to the holder so that the latter turns around its axis due to interaction of the string with the pelt.

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**3,744,280**

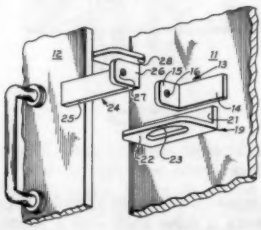
**HIGH SECURITY LOCKING MECHANISM**

**William D. Brown, Jr., Subic Bay, Philippines, and Edward Gabrielson, El Cajon, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed July 28, 1972, Ser. No. 277,717**

**Int. Cl. E05b *67/38***

**U.S. Cl. 70—54** **4 Claims**



A locking mechanism for securing one or two doors by using a padlock and having means preventing cutting or breaking said padlock. A keeper is attached to a first door ele-

ment, and a hasp is attached to a second door element and has a shackle guard that prevents a cutting device from engaging a shackle of a padlock connecting the keeper and hasp. A lock guard is attached to the first door element beneath the keeper and protects the case of said padlock.

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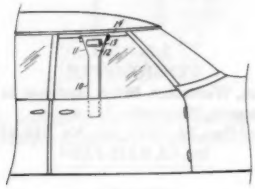
**3,744,281**
**CAR KEY HOLDER**

**Russell F. Logue, and William Kolath, 2244 S. Kingshighway, both of 2244 S. Kingshighway, Mo.**

**Filed Nov. 26, 1971, Ser. No. 202,216**
**Int. Cl. E05b** *69/00, 73/00*
**U.S. Cl. 70—58** **1 Claim**



A car key holder comprising a receptacle with a closure adapted to receive an ignition key for a car. The holder can be attached to the exterior of a car on a door window. Access to the ignition key and the receptacle is gained by use of a second key.

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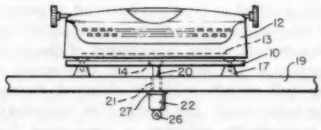
**3,744,282**
**OFFICE EQUIPMENT LOCKING DEVICE**

**Robert W. Hemphill, Kendall Park, N.J., assignor to Sekur-It Products, Inc., Newark, N.J.**

**Filed Nov. 15, 1971, Ser. No. 198,908**
**Int. Cl. E05b** *73/00*
**U.S. Cl. 70—58** **5 Claims**



A locking device for portable equipment, such as typewriters, adding machines, television sets, etc., comprises a rectangular metal plate adapted to be fastened to the underside of said equipment in substantially completely covering relation to said underside e.g., adjacent the supporting legs thereof. At least one elongated shaft extends at right angles to and below the plate for insertion through a pre-drilled hole in a supporting surface for the piece of equipment. A key-operated lock member engages the shaft below the supporting surface to lock the piece of office equipment to the supporting surface.

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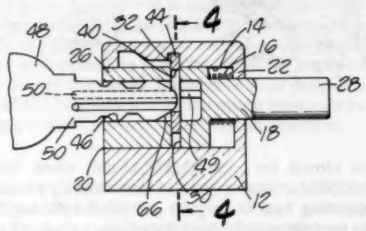
**3,744,283**
**KEY ACTUATED BOLT LOCK**

**Joseph J. Schmidt, Los Angeles, Calif., assignor to Builders Brass Works Corporation, Los Angeles, Calif.**

**Filed Dec. 27, 1971, Ser. No. 212,135**
**Int. Cl. E05b** *65/08, 29/04*
**U.S. Cl. 70—90** **12 Claims**

A nonrotating key actuated bolt lock having a spring biased bolt member slidably mounted within a housing. One end of the bolt member is adapted to receive a key, while the opposite end functions as a locking plunger. At least one tumbler



is positioned within the key receiving end of the bolt member and is tripped by the insertion of the key therein.

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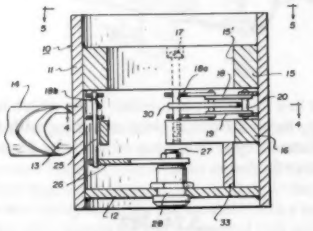
**3,744,284**
**TAMPER-PROOF SECURITY DEVICE**

**Carl G. Waldenstrom, 1015 W. Medinah, Bensenville, Ill.**

**Filed Feb. 22, 1972, Ser. No. 228,106**
**Int. Cl. F16b** *41/00*
**U.S. Cl. 70—232** **9 Claims**



A tamper-proof vehicle security device for lockable attachment to the coupling means of a trailer to prevent unauthorized securement of a driving vehicle to the trailer. The securing device includes a housing which surrounds the coupling means, and chain elements are moveable within the housing to lock the housing to the coupling means or permit removal of the securing device. The chain elements are operatively connected to a lock mechanism to effect a desired locking operation. The housing is provided with an exteriorly positioned handle to facilitate mounting and removal of the security device from the trailer.

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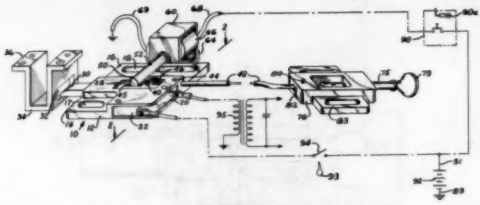
**3,744,285**
**IGNITION & HOOD LOCK ASSEMBLY FOR AUTOMOTIVE VEHICLE**

**Sam Barmherzig, Brooklyn, N.Y., assignor to Security Techniques, Inc., Brooklyn, N.Y.**

**Filed Apr. 5, 1971, Ser. No. 131,221**
**Int. Cl. B60r** *25/04;* **E05b** *65/19, 47/06*
**U.S. Cl. 70—241** **4 Claims**

An ignition and hooklock assembly for an automotive vehicle includes a support mounted under the hood and carrying an axially slidable bolt movable between two positions for locking and unlocking the hood. A solenoid having a spring loaded plunger engages the bolt in each position to prevent axial movement of the bolt. A remotely located switch is connected in series with a power supply and the solenoid which

when energized releases the bolt which can then be moved axially by an attached wire terminating in an operating handle. A pushbutton switch disposed in the support is connected in the



ignition circuit for closing this circuit when the bolt is retracted. Either one or both of the remotely located switch and operating handle may be provided with key operated locks to prevent unauthorized operation.

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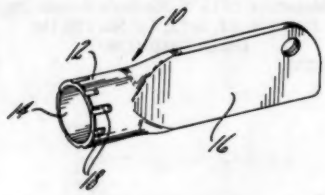
**3,744,286**

**TUBULAR KEY**

**Patrick M. Trainor, Chicago, Ill., assignor to Fort Lock Corporation, Chicago, Ill.**

**Filed Feb. 1, 1972, Ser. No. 222,601**
**Int. Cl. E05b *19/02***
**U.S. Cl. 70—404** **2 Claims**



A tubular key for axial pin tumbler locks which is integrally and unitarily formed from a piece of tubing with the handle end being formed by a flattening of the tube for a predetermined distance from one end.

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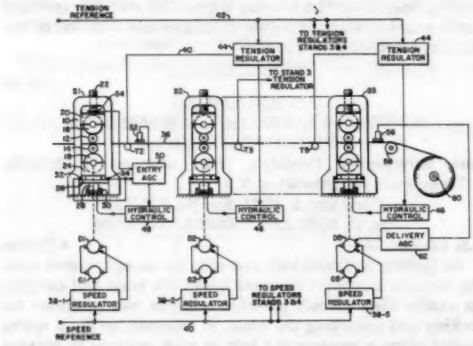
**3,744,287**

**HYDRAULIC INTERSTAND TENSION REGULATING AND AUTOMATIC GAUGE CONTROL SYSTEM FOR MULTI-STAND ROLLING MILLS**

**Antonio V. Silva, San Paulo, Brazil, and George P. Gaines, Williamsville, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 14, 1971, Ser. No. 180,374**
**Int. Cl. B21b *37/12***
**U.S. Cl. 72—8** **12 Claims**




A system for controlling the delivery gauge and the interstand tensions of a tandem rolling mill by means of hydraulic cylinders located at each stand of the mill. The hydraulic cylinders, in turn, are controlled by the electrical circuitry of this invention. Gauge is controlled at the first and last stands only, while interstand tension is controlled by tensiometer feedback signals which are compared with tension reference signals to generate error signals for controlling the pressure exerted by the hydraulic cylinders and, thus, the roll gap at each stand. The speeds of all stands except the last are maintained constant. The system incorporates a deadband feature to avoid excessive operation of the hydraulic cylinders in response to noise signals.

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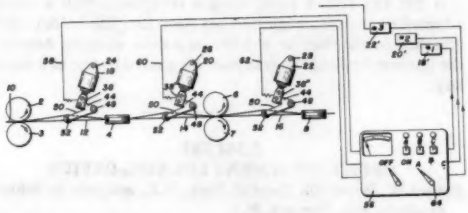
**3,744,288**

**TENSIOMETER**

**Robert D. Wykes, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.**

**Filed Dec. 22, 1971, Ser. No. 210,852**
**Int. Cl. B21b *37/04***
**U.S. Cl. 72—17** **7 Claims**



Mechanism for determining and varying the tension present in a rod being rolled as it passes between adjacent stands in a rod mill. The read-out gives an indication enabling the operator to make manual speed adjustment of the rolls to change the rod tension to the desired norm, or through a feed-back device the roll speeds may be changed automatically to achieve the same result. The mechanism operates on the principle of temporarily applying a transverse force moved through a fixed distance against the moving rod. The resistance to this force measured by a load cell and associated meters will give an indication of the then existing rod tension as it moves between adjacent roll stands and an indication of the adjustment to be made in roll speeds to change the rod tension to the desired norm.

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**3,744,289**

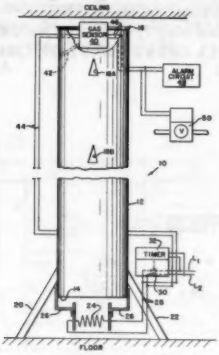
**APPARATUS FOR SENSING COMBUSTIBLE GASES OF DIFFERING DENSITIES**

**Ellsworth H. Lown, Milltown, N.J., assignor to Alfred Charles, Milltown, N.J., a part interest**

**Filed Sept. 24, 1971, Ser. No. 183,549**
**Int. Cl. G01n *1/26***
**U.S. Cl. 73—23** **7 Claims**

A system for sensing the presence of a combustible gas mixture, whether caused by a heavier-than-air or lighter-than-air combustible gas, including a vertical chimney having its bot-

tom near the floor of a room and its top near the ceiling, and an intermittent updraft and a combustible gas sensor near the top of the chimney: a chimney with intermediate ports.



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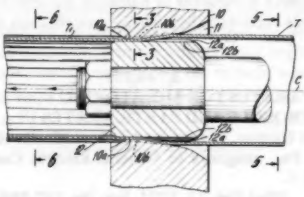
3,744,290

**PRODUCTION OF INTERMITTENTLY FLUTED TUBES**

**Benoit J. Sirois, East Brunswick, N.J., assignor to Phelps Dodge Copper Products Corporation, New York, N.Y.**

**Filed Oct. 18, 1971, Ser. No. 190,148**
**Int. Cl. B21c *3/06***
**U.S. Cl. 72—283** **4 Claims**



A fluted mandrel is movable axially within the tube which is drawn through a fluting die, the ridges of the fluted mandrel being aligned with the valleys formed by the fluted die. In one axial position of the mandrel, where it is fully within the die, its ridges and valleys are radially opposite the valleys and ridges, respectively, of the die, whereby the tube is fluted internally and externally as it is drawn through the die. However, when the mandrel is withdrawn axially from this fluting position and the tube moves through the die, the tube-fluting operation is interrupted and the die merely forms shallow impressions in the external surface of the tube.

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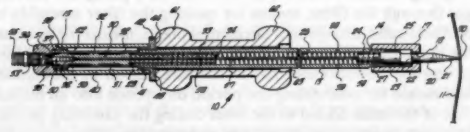
3,744,291

**PNEUMATIC HOLE PIERCING APPARATUS**

**William K. Hagerty, Alhambra, and Travis L. Hunter, La Verne, both of Calif., assignors to Vantage Tool, Incorporated, South El Monte, Calif.**

**Filed June 17, 1971, Ser. No. 154,082**
**Int. Cl. B21d *31/02***
**U.S. Cl. 72—325** **25 Claims**



A pneumatically driven hole piercing apparatus is disclosed having an internally located valve actuator directly connected to the piercing tool to enable the air valve to be triggered by the tool. The hole piercing apparatus comprises a hollow cylindrical body having a threaded piercing tool movably mounted within the forward end thereof. An axially movable piston is located within the body and is adapted to strike the enclosed end of the piercing tool upon the admission of the piston motive fluid through a valve located at the rearward end of the body. A valve rod is also located within the body and is adapted to slidably extend through the piston for interconnecting the piercing tool with the valve. Upon a rearward movement of the piercing tool, the valve rod is moved rearwardly to unseat the valve. The motive fluid then enters the chamber within the body to urge the piston forwardly to strike the piercing tool and move it in the forward direction.

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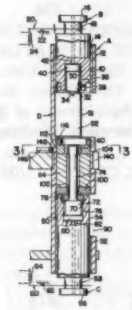
3,744,292

**UNITARY INTERCHANGEABLE TOOL MODULE**

**Anatol Michelson, Media, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.**

**Filed Sept. 20, 1971, Ser. No. 182,141**
**Int. Cl. B21j *13/04***
**U.S. Cl. 72—354** **7 Claims**



A unitary interchangeable module unit for performing a selected metal working process including a housing having a pair of opposed bores in which there are reciprocally mounted a pair of tool support members. The module includes securing means for releasably securing the module onto a support plate carrying the drive means for the reciprocal tool members.

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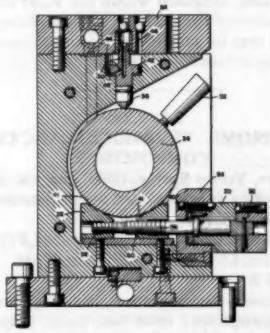
3,744,293

**DIE RING MOUNTING AND ADJUSTMENT APPARATUS**

**Stanley J. Miller, Crystal Lake, Ill., assignor to National Can Corporation, Chicago, Ill.**

**Filed Aug. 4, 1972, Ser. No. 278,064**
**Int. Cl. B21c *3/12***
**U.S. Cl. 72—467** **10 Claims**



A device for readily mounting and adjusting an annular die ring in a die box, characterized by two cradle members

movably mounted on a base and aligned to support a ring, releaseable opposite clamping means, preferably a pneumatically operated piston, means attached to both of the cradle members and extending away from the die box to move the cradle members in tandem, generally in the plane of the ring, and means attached to the cradle members and extending away from said die box to move the cradle members toward and away from each other in the plane of the ring. The tandem and relative motion provide adjustment in two different directions along perpendicular axes. In a preferred embodiment, the tandem adjustment means is a screw piece carrying an independently rotatable shaft. The relative adjustment means comprises the same shaft, which has oppositely threaded portions in each of the cradle members, and a gripping means to turn the shaft.

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## ERRATUM

For Class 73—23 see:
Patent No. 3,744,289

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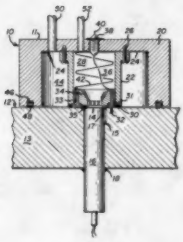
### 3,744,294
### ACOUSTICAL TRANSDUCER CALIBRATING SYSTEM AND APPARATUS

**Thomas L. Lewis, and Robert B. Cohn, both of Lancaster, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Oct. 14, 1971, Ser. No. 189,290**
**Int. Cl. G01v *13/00***
**U.S. Cl. 73—1 DV** **7 Claims**



An acoustical transducer calibrating system including a differential pressure actuating device having an inner chamber for applying differential pressures to the transducer under test, and an outer chamber for vacuum sealing the device to the surface under test. Mounted within the inner chamber is an electrostatic actuator for exciting the transducer at selected frequencies so that its sensitivity can be determined for different operating ambient pressures.

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### 3,744,295
### PHOTOCHROMIC-THERMOCHROMIC COATING COMPOSITION

**Sidney Allinikov, Yellow Spring, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

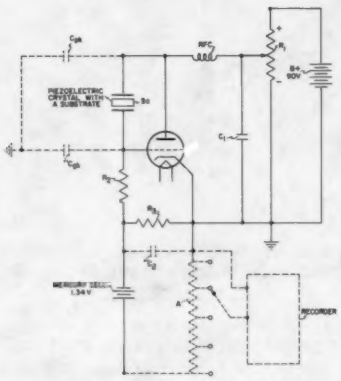
**Filed Nov. 24, 1971, Ser. No. 201,975**
**Int. Cl. G01r *25/18*; G01n *19/08***
**U.S. Cl. 73—15 R** **5 Claims**

A photochromic-thermochromic coating composition is provided that comprises a resin base paint, a dye and an enzyme. The coating composition is sensitive to light and heat, thereby rendering it particularly useful in the non-destructive testing of structures to determine the presence of possible flaws.

### 3,744,296
### COATED PIEZOELECTRIC ANALYZERS

**Morton Beltzer, Westfield, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.**

**Filed May 7, 1971, Ser. No. 141,335**
**Int. Cl. G01n *27/00, 31/00*; G01r *29/22***
**U.S. Cl. 73—23** **13 Claims**



Piezoelectric and magnetostrictive materials coated with charge transfer complexes of halogens are effective detectors for materials capable of being halogenated, such as olefins.

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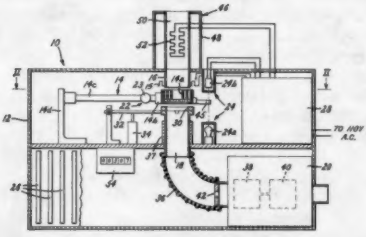
### 3,744,297
### APPARATUS FOR MONITORING SUSPENDED AEROSOLS AND PARTICULATES IN A GAS

**Jack Orvel Hanson, Wayne, and Robert Martin Ross, Radnor, both of Pa., assignors to General Electric Company, New York, N.Y.**

**Filed Oct. 12, 1971, Ser. No. 187,986**
**Int. Cl. G01n *15/00***
**U.S. Cl. 73—28** **4 Claims**

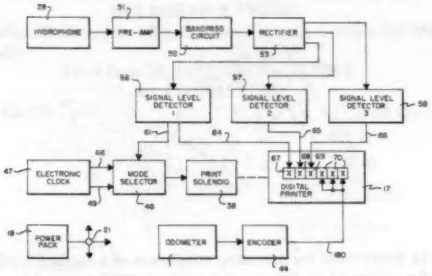


Apparatus for monitoring suspended aerosols and solid particulates in a gas. The apparatus consists basically of a filter in a spring-mounted holder, means such as a pump for moving gas through the filter, means for causing the filter assembly to oscillate substantially in a horizontal plane, means for measuring the period of oscillation of the filter assembly and for comparing the period measured to the tare period of oscillation, and means for converting the period difference into an indication of the mass added to the filter during the sampling period. In its preferred embodiment the apparatus includes means for assuring that the filter and matter collected thereon have sufficiently low moisture content during the weighing operation.

## 3,744,298
## PIPELINE LEAK DETECTOR AND METHOD

Norman E. Flournoy, and Ralph H. Clinard, Jr., both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 24, 1971, Ser. No. 183,500
Int. Cl. G01m 3/24
U.S. Cl. 73—40.5 A 11 Claims



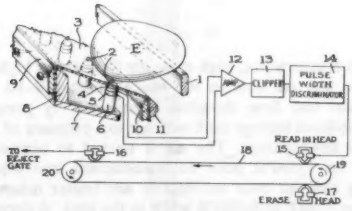

Pipeline leak detection method employs a record strip that advances at low speed unless acoustic energy from a leak is detected. When it is detected the record advance is greatly speeded up in order to adequately identify and record the leak-generated energy.

Pipeline leak detection apparatus is mounted on an internal pipeline vehicle. It includes a record strip with means to increase the speed of traversing the strip as acoustic energy from a leak is detected. Additionally, there may be an improved odometer associated with the vehicle to make highly accurate distance measurement for locating the vehicle when a leak is detected.

## 3,744,299
## CRACK DETECTOR

George N. Bliss, Franklin, Mich., assignor to Diamond International Corporation, New York, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,657
Int. Cl. G01m 7/00
U.S. Cl. 73—67.1 13 Claims

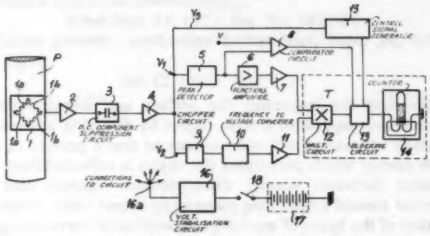



Distinguishing a cracked article from a sound article by tapping the article with a vibration transducer means and detecting and measuring either the width of a pulse, the length of a pulse train, or the curve of a voltage input to the article against the curve of the voltage output from the article. The vibration transducer means in one embodiment is vibration sensitive elements such as piezoelectric crystals placed in a row to receive the article under test being rolled over it, connected to amplifying and discriminating means which may be followed by recording means for later removal of cracked objects.

## 3,744,300
## SYSTEM FOR DETERMINING THE FATIGUE OF A STRUCTURE EXPERIENCING VARYING STRESSES

Gerard Fleury, Marseille, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 13, 1971, Ser. No. 206,999
Claims priority, application France, Dec. 23, 1970, 7046433
Int. Cl. G01n 3/00
U.S. Cl. 73—67.3 11 Claims

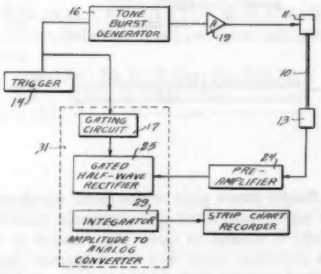



A system for measuring fatigue damage in helicopter blades is based on a determination of the number of force cycles to which the blade is subjected and on the amplitude of the force experienced in each cycle.

## 3,744,301
## ULTRASONIC VOID FRACTION DETECTOR

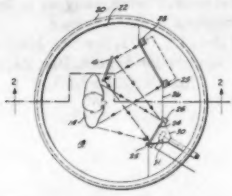
Alvin E. Arave, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 9, 1971, Ser. No. 178,988
Int. Cl. G01n 29/00
U.S. Cl. 73—67.6 5 Claims




The attenuation of an ultrasonic tone burst propagated in a wire is measured to determine the void fraction of a gas-liquid mixture. When the gas-liquid mixture consists of a layer of gas over a liquid, the void fraction detector can be used as a liquid level indicator.

3,744,302
SPATIALLY COHERENT SONIC WAVE OBJECT INSPECTION DEVICE
Thomas R. O'Meara, Jr., Malibu Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Aug. 25, 1966, Ser. No. 575,114
Int. Cl. G01n 9/24
U.S. Cl. 73—67.7 5 Claims



A system for inspecting the surface and internal three-dimensional aspects of a solid object by directing a beam of spatially coherent sonic wave energy so that a portion of the wave energy which penetrates the object is reflected from interfaces between density discontinuities therein and is directed toward a recording plane as an object beam. Another portion of the beam of spatially coherent sonic wave energy is reflected directly from a reflecting surface and directed to the recording plane as a reference beam. The object beam and the reference beam form an interference fringe pattern at the recording plane which is recorded on a transparency. Thereafter, three dimensional images of the object can be reconstructed by directing a laser beam through the transparency and looking through the transparency.

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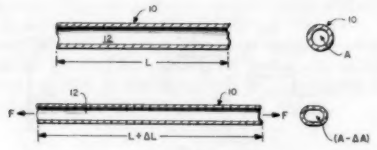
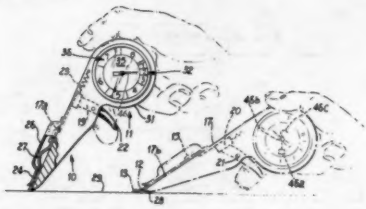
3,744,303
PURE FLUIDIC STRAIN GAGE
Tadeusz M. Drzewiecki, Gaithersburg, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 23, 1971, Ser. No. 201,482
Int. Cl. G01b 5/30; F15c 1/08
U.S. Cl. 73—88 R 5 Claims




A pure fluidic strain gage is disclosed which comprises a conduit or duct constructed of deformable material through which a fluid is caused to flow. The conduit is adapted to receive an external stress and be deformed thereby in a predetermined manner such as by a change in length or the like of the conduit. This deformation produces a change in fluid resistance in the channel and thus effects a variation in the flow characteristics of the fluid through the conduit. A monitoring device, such as a fluidic proportional amplifier, is provided to detect such variations in flow characteristics, these variations being indicative of the value of the external stress received by the conduit and the strain of the conduit.

3,744,304
ASSESSMENT OF ROUGHNESS
Myron Peter Rubert, Fernhill Woodbrook Road, Alderley Edge, Cheshire, England
Filed May 20, 1971, Ser. No. 145,318
Claims priority, application Great Britain, May 26, 1970, 25,115/70
Int. Cl. G01b 5/23
U.S. Cl. 73—105 12 Claims



An instrument for assessing roughness of a surface having a probe arranged to engage the surface and be urged towards the surface in the direction of the probe which is arranged to yield when the probe is at a critical angle to the surface dependent on the surface roughness.

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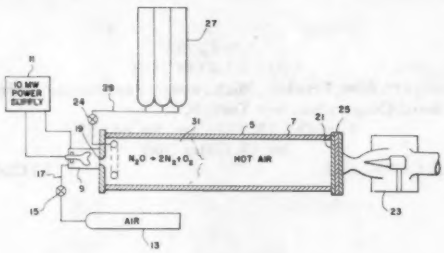
3,744,305
APPARATUS AND METHOD FOR GENERATING LARGE MASS FLOW OF HIGH TEMPERATURE AIR AT HYPERSONIC SPEEDS
Alexander P. Sabol, Williamsburg, and Roger B. Stewart, Yorktown, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Mar. 9, 1972, Ser. No. 233,173
Int. Cl. G01m 9/00
U.S. Cl. 73—147 13 Claims




High temperature, high mass air flow and a high Reynolds number test air flow in the Mach number 8–10 regime of adequate test flow duration is attained by pressurizing a ceramic-lined storage tank with air to a pressure of about 100 to 200 atmospheres. The air is heated to temperatures of 7,000° to 8,000°R prior to introduction into said tank by passing said air over an electric arc heater means. The air cools to 5,500° to 6,000°R while in the tank. A decomposable gas such as nitrous oxide or a combustible gas such as propane is injected into said tank after said pressurization and the heated pressurized air in said tank is rapidly released through a Mach number 8–10 nozzle. The injected gas medium upon contact with the heated pressurized air effects an exothermic reaction which maintains the pressure and temperature of the pressurized air during the rapid release.

The novel apparatus employed in the method comprises an elongated ceramic-lined storage tank having an inlet and an outlet, means for supplying air under presure to said tank through said inlet, electric arc heating means for heating said

air prior to its introduction into said tank, a Mach number 8–10 hypersonic nozzle provided said outlet for discharging the heated and pressurized air from said tank, and means for supplying nitrous oxide near said inlet for suppliing said heated air.

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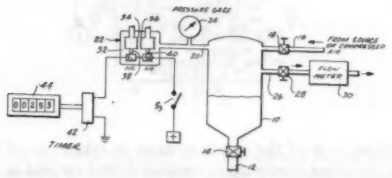
**3,744,306**

## METHOD AND APPARATUS FOR MEASURING THE ULLAGE OF A VESSEL

**Rudolph E. Krueger, 1201 Dolphin Terrace, Corona Del Mar, Calif.**

**Filed June 30, 1972, Ser. No. 267,917**
**Int. Cl. G01f 17/00**
**U.S. Cl. 73—149** **14 Claims**




There is described a system for indicating the remaining volume or ullage of a fully enclosed tank or other vessel in which the vessel is pressurized above atmospheric pressure and the air then permitted to discharge from the tank at a substantially constant rate. The time required for the pressure to drop from a first level to a second level of pressure provides an indication of the free volume in the tank.

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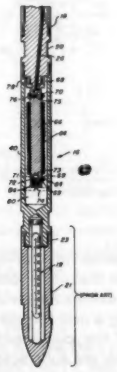
**3,744,307**

## PRESSURE GAUGE

**James C. Harper, and Robert P. Green, both of Tulsa, Okla., assignors to Geophysical Research Corporation, Tulsa, Okla.**

**Filed June 28, 1972, Ser. No. 267,003**
**Int. Cl. G01l 7/00**
**U.S. Cl. 73—152** **4 Claims**



In the wire line instruments used for measuring bottom hole pressure and temperature in deep bore holes in the earth, particularly wells used for the production of petroleum liquids and gases, a Bourdon tube is used as the pressure sensing element. This invention relates to an improved method of isolating the liquid inside of the Bourdon tube from the contamination of the well fluids, while still maintaining an accurate transmission of well fluid pressure to the Bourdon tube.

In place of the conventional bellows which has been used to isolate the Bourdon tube from the well fluids, this invention involves a long slender helical tubing which is connected to the Bourdon tube at its upper end and to the well fluids at its lower end. The volume of liquid inside the helical tube is several times the volumetric liquid flow of well fluids into the tubing so that contamination which may enter the bottom of the tubing never reaches the top. Means are provided for flushing out, from the top, the liquid in the helical tubing and for cleaning out from the bottom end, the contaminated well fluids which have been forced into the bottom of the tubing under the bottom hole pressure in the well.

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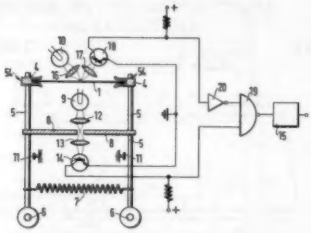
**3,744,308**

## ARRANGEMENT FOR SENSING DAMAGE TO THE EDGE PORTIONS OF A FILM

**Horst Dieter Vogt, Zurich, Switzerland, assignor to CIBA-GEIGY AG, Basel, Switzerland**

**Filed Sept. 21, 1971, Ser. No. 182,354**
**Claims priority, application Switzerland, Sept. 24, 1970, 14135/70**
**Int. Cl. G06k 7/04, 7/10**
**U.S. Cl. 73—157** **5 Claims**



A sensing arrangement for detecting edge cracks and perforation damage in a film being transported to a developing machine has a pair of pivotally-mounted, mechanical sensing elements spring-biased to act on opposite edges of the moving film. The pressures with which the sensing elements act on the film lie in the plane of the film. The sensing elements deflect in response to edge damage of the film and control a shutter in an infrared light path to provide a fault-indicative signal. To ensure that this signal does not cause the film transport mechanism to be stopped simply because no film is present, a film presence sensor is provided to provide a control signal to a gate through which the fault-indicative signal is transmitted.

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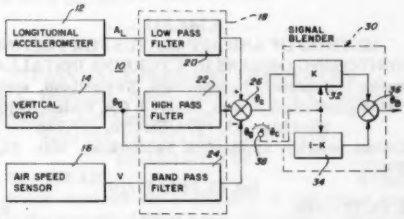
**3,744,309**

## PITCH SIGNAL CALCULATOR FOR AIRCRAFT

**Ralph A. Astengo, Bellevue, Wash., assignor to United Control Corporation**

**Filed July 20, 1970, Ser. No. 56,613**
**Int. Cl. G01c 23/00**
**U.S. Cl. 73—178 R** **6 Claims**




An instrument for calculating the pitch angle of an aircraft from two pitch signals, one having long term and the other

short term pitch accuracy. The long term pitch signal is derived from a longitudinal accelerometer. A measured pitch signal having short term accuracy is provided by a vertical gyroscope. An airspeed acceleration signal is provided by a vertical gyroscope. An airspeed acceleration signal is subtracted from the accelerometer output to eliminate the acceleration component of the signal.

The calculated and measured pitch signals are combined or blended in selected inverse proportions.

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**3,744,310**

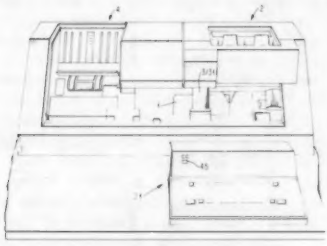
## POSITIONING DUAL RECORD CARDS IN A COMPOSITE PUNCH/READ STATION IN COORDINATION WITH KEYING OF SOURCE INFORMATION TAKEN FROM PORTIONS OF THE CARD WHICH MAY BE OBSTRUCTED BY STATION COMPONENTS

**Richard B. Battistoni, Pleasant Valley; John Lettieri, Woodstock; Donald L. Pierce, Hyde Park, and Walter J. Weikel, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 29, 1971, Ser. No. 193,899**

**Int. Cl. G07c *11/00***

**U.S. Cl. 73—156** **8 Claims**



Dual record cards (i.e., cards including provision on respective surfaces for containing printed or written source data intended to correspond to information punches of the same card) are subjected to dynamically coordinated escape positioning and process handling (e.g., reading and verification) in a composite Punch/Read process station. Card positioning and station processing operations (e.g., verification read-sensing of pre-punched card data) are dynamically coordinated with viewing and keying operations conducted with respect to source data writings contained on respective card surfaces. Coordination is achieved through program information pre-loaded into the system buffer store. Such information interrupts automatic card escapement at appropriate intermediate column processing position(s) relative to the station, whereby the key operator is given an unobstructed view of source data on the card which is subject to being obstructed otherwise and which is requisite to continuation of process handling. Escapement is permitted to resume thereafter only upon completion of a number of valid key entry manipulations related functionally to the column processing position of the card at interruption.

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**3,744,311**

## METHOD OF AND APPARATUS FOR TESTING MONITORING ORGANS IN A TURBINE INSTALLATION

**Cornelis Kalverboer, Nussbaumen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland**

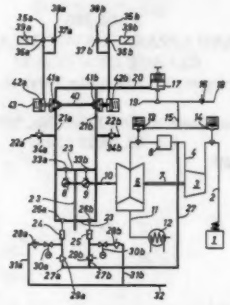
**Filed Mar. 23, 1971, Ser. No. 127,246**

**Claims priority, application Switzerland, Mar. 31, 1970, 4759/70**

**Int. Cl. F01d *21/20***

**U.S. Cl. 73—168** **6 Claims**

Two sets of speed and pressure monitoring organs are located respectively in two safety systems normally operated in parallel and independently of each other for protecting a turbine against overspeed and also against overpressure in a unit such as a water separator or the like located in the gas flow path. In order to test the monitoring organs of both systems for determining whether or not they would function properly in the event of an actual overspeed or overpressure



condition, one of the safety systems is taken out of service while the other continues to monitor actual turbine speed and pressure, and vice versa, and the speed and pressure monitoring organs of the safety system removed from service are then tested by introducing test speed and pressure values.

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**3,744,312**

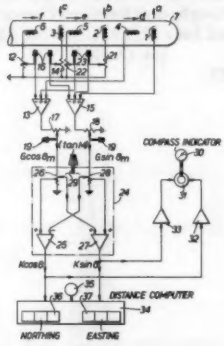
## NAVIGATION APPARATUS

**Edward William Anderson, Cheltenham, England, assignor to Smiths Industries Limited, London, England**

**Filed June 2, 1971, Ser. No. 149,168**

**Int. Cl. G01c *21/08, 23/00***

**U.S. Cl. 73—178** **14 Claims**



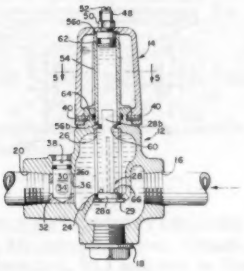

Navigation apparatus for a military tank includes three flux-valve detector-pairs that each sense fore-aft and athwartships components of the earth's magnetic field at different distances from the craft along a non-ferromagnetic boom. Fractionally-weighted values of the components sensed by the detector-pair nearest the tank are subtracted from their corresponding component-values sensed by the detector-pair furthest from the tank. To the results of the subtractions there are added fractionally-weighted values of the components sensed by the intermediately-located detector-pair so as thereby to derive component-values corrected for the craft-produced magnetic-deviation and also for changes in location of the effective magnetic-center of the tank arising from changes in orientation of the tank's gun. These values, before they are used to indicate tank-heading and compute northing and easting of the craft, are corrected for local magnetic-variation by combining with a fraction of each, a preselected fraction of the other.

3,744,313

## FLUID FLOW METERING DEVICE

Frank R. Thompson, Cranston, R.I., assignor to Taco, Inc., Cranston, R.I.

Filed Sept. 21, 1970, Ser. No. 73,900
Int. Cl. G01f 1/00
U.S. Cl. 73—208 8 Claims



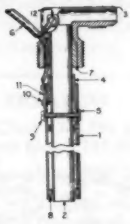
A device for metering fluid flow, including a casing adapted for connection to a conduit and having a chamber registering with said conduit, and a plunger movable in the chamber in proportion to the amount of fluid flow through the chamber for giving an indication of the fluid flow. A valve is provided in the chamber for regulating the amount of fluid flow.

3,744,314

## FUEL GAUGES

Charles M. Lenny, 314 Tampa Avenue, Indialantic, Fla.

Filed Jan. 27, 1971, Ser. No. 110,145
Int. Cl. G01f 23/26
U.S. Cl. 73—304 C 2 Claims



Two coaxial tubes serving as plates of a capacitor to sense level of liquid. The level of liquid between the tubes being in proportion to the liquid level to be sensed. A circuit is provided responsive to the capacitance between the tubes including apparatus to vary the gain of an amplifier of the circuit to be lower at lower levels of the liquid.

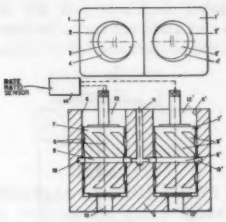
3,744,315

## METHOD AND A DEVICE FOR DETERMINING THE TEMPERATURE AT VISCOSITY MEASUREMENTS

Gilles Gerardus Hirs, Pijnacker, Netherlands, assignor to Nederlands Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoere Van Nijverheid, Handel en Verkeer, Hague, Netherlands

Filed Dec. 10, 1970, Ser. No. 96,921
Claims priority, application Netherlands, Dec. 12, 1969, 6918731
Int. Cl. G01k 11/00, 13/02; G01n 11/04
U.S. Cl. 73—344 6 Claims

Two capillary-viscometers which are identical except for differing as regards the extent to which the width of their capillaries depends on the temperature, are simultaneously used for identical measurements under identical conditions.



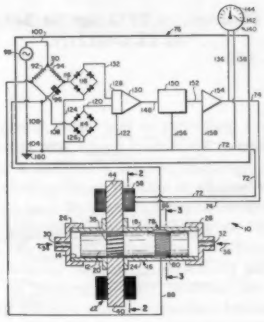
The ratio of the two measuring values is a direct indication for the exact temperature that exists in the viscometers.

3,744,316

## ULTRA-LOW FLUID PRESSURE AND ULTRA-LOW FORCE MEASURING APPARATUS

Roman Kuzyk, Trenton, N.J., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 26, 1971, Ser. No. 175,183
Int. Cl. G01l 9/12
U.S. Cl. 73—398 C 10 Claims



An ultra-low fluid pressure and force measuring apparatus whose accuracy is limited only by the friction introduced by a substantially frictionless hydrodynamic air bearing formed between an inside of a cylinder and an outer surface of a piston against one or both ends of which a pressure or force under measurement is applied. Capacitor plates mounted on the cylinder and moveable piston form a sensor for a force balanced capacitance feedback circuit which in turn transmits an electrical signal to: No. 1. an indicator to show the degree of displacement of the piston due to the difference in magnitude of the apposing fluid pressures or forces acting on the piston and No. 2. to a stator that surrounds an armature within said piston to rotate same and to apply an axial rebalancing magnetic force thereto.

3,744,317

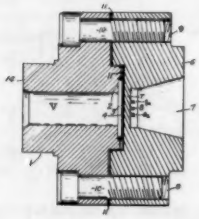
## STRAIN GAGE PRESSURE TRANSDUCER

William A. Hessinger, North Tonawanda, N.Y., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Oct. 12, 1971, Ser. No. 187,979
Int. Cl. G01l 9/04
U.S. Cl. 73—398 AR 4 Claims

This device operates via a plurality of foil strain gages bonded to the controlled stress zones of a pressure responsive diaphragm or relatively thin wall, the strain gages being connected in a Wheatstone bridge arrangement. As a fluid under pressure is introduced into the fluid medium cavity or channel

the pressure is transferred through a thin preferably metal diaphragm to the sensing diaphragm or wall to which is attached the electrical type strain gages which are connected in



a Wheatstone bridge circuit which provides an electrical transfer function proportioned to the applied fluid cavity pressure.

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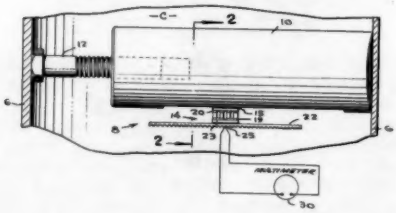
**3,744,318**

**METHOD AND APPARATUS FOR MEASURING ULTRA-LOW GAS PRESSURES**

**James J. Kulesz, 5335 Glen Ridge, Apt. 2020, San Antonio, Tex.**

**Filed Apr. 20, 1972, Ser. No. 245,898**
**Int. Cl. G01l *21/12***
**U.S. Cl. 73—399** **10 Claims**



A thermoelectric cooling device is mounted in a low-pressure chamber having its hot side connected to a heat sink and its cold side connected to the heat absorbing plate of a large area; a thermocouple is connected to the plate; in one method of operation the thermoelectric cooling device is provided with constant current so that the heat absorbing plate is cooled to a lower temperature than the temperature of the gas in the chamber and variations in temperature of the plate are indicative of the pressure in the chamber since molecular heat flow is proportional to pressure; in another method of the invention the current to the thermoelectric cooling device is varied to maintain a constant temperature of the heat absorbing plate with variations in current to the thermoelectric cooling device being indicative of the pressure in the chamber.

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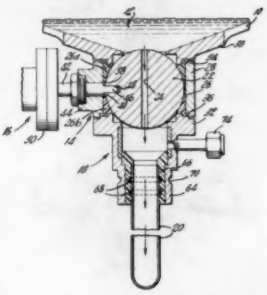
**3,744,319**

**LIQUID-SAMPLING STRUCTURE**

**Clyde S. Harmes, III, Schnecksville, Pa., assignor to New Brunswick Scientific Co., Inc., New Brunswick, N.J.**

**Filed June 8, 1971, Ser. No. 151,022**
**Int. Cl. G01n *1/10***
**U.S. Cl. 73—422 R** **7 Claims**

A liquid-sampling structure located at the bottom of a vessel which contains the liquid from which samples are to be taken. A valve is located at the bottom end of the vessel and has a closed position closing the vessel and an open position providing a passage through which a sample of the liquid in the vessel can flow, a suitable supporting structure being located beneath the valve for supporting a test tube which receives the sample. A valve actuator is operatively connected with the valve to displace between its closed and open positions. A



structure is operatively connected with the valve to form a fluid passage through which a cleaning fluid can be directed through the valve when it is in its closed position so as to clean the valve with a cleaning fluid while the valve is in its closed position. An additional fluid passage is provided for providing a path for a cleaning fluid in order to clean the interior of the structure which supports a test tube beneath the valve.

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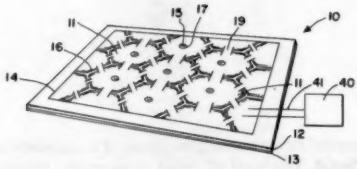
**3,744,320**

**PRESSURIZED PANEL**

**Erskine C. White, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Division of Ser. No. 777,765, Nov. 21, 1968. This application Nov. 6, 1970, Ser. No. 97,472**
**Int. Cl. G01w *1/00***
**U.S. Cl. 73—432 R** **5 Claims**



Large area pressurized meteoroid penetration detector panels. The structure of the panels includes an interconnected cellular configuration in which the cells have spaced periphery welds and tufts in their centers at which point a spot-weld is made joining the panels.

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**3,744,321**

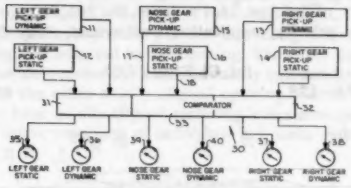
**ROTATING BODY UNBALANCE DETECTOR-LOCATOR**

**John D. Hauge, 6122 Carrollton Avenue, Indianapolis, Ind.**

**Filed Dec. 16, 1971, Ser. No. 208,784**
**Int. Cl. G01m *1/14***
**U.S. Cl. 73—457** **3 Claims**

A system of units of rotating body unbalance detectors and locators each unit having a pair of mechanical-to-electrical converter vibration sensors affixed to the suspension structure of each rotating body on two axes normal to each other and normal to the axis of rotation with the electrical outputs cou-

pled to a comparator circuit for comparing with steady state voltage to produce outputs on indicator means for indicating




static and/or dynamic unbalance in the channels of each unit rotating body in the system.

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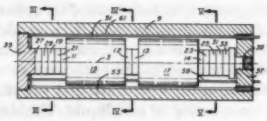
**3,744,322**

## ANGULAR VELOCITY SENSORS

**Gordon C. Pacey, Mansonville, Quebec, Canada, and Sumner H. Wolfson, Northfield, Vt., assignors to Space Research Corporation, North Troy, Vt.**

**Filed Dec. 7, 1970, Ser. No. 95,865**
**Int. Cl. G01c *19/56***
**U.S. Cl. 73—505** **15 Claims**



An angular rate sensor is disclosed which includes a plurality of proof masses driven so that each has a cyclically repetitive movement and so that the motions of the proof masses balance one another to provide inertial balance, and sensor means arranged to provide an output indicative of Coriolis forces on the said masses when the sensor is subjected to angular velocity about at least one predetermined axis. The device can also be used to measure translational accelerations and rotational accelerations along two axes.

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## ERRATUM

For Class 73—299 see:
Patent No. 3,745,001

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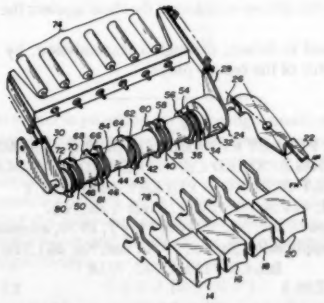
**3,744,323**

## CAM ISOLATOR FOR COMMON LOCK MEMORY SYSTEM

**Emery E. Olah, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Nov. 15, 1971, Ser. No. 198,682**
**Int. Cl. F16h *35/18***
**U.S. Cl. 74—10.37** **6 Claims**



A common lock memory mechanism for a pushbutton tuner includes a spring washer positioned between each spacer and an adjacent cam to provide sufficient friction to hold the cams in position with respect to the shaft with the common lock unlocked. A wave or star washer is located between adjacent spacers to prevent movement of the spacers with respect to each other with the common lock unlocked except the selected cam is rotated to set the same to a desired station in response to actuation by the associated pushbutton.

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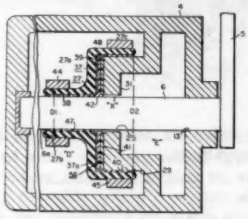
**3,744,324**

## TORSIONAL ROTARY SHAFT SEAL

**John F. Perkins, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Jan. 21, 1971, Ser. No. 108,262**
**Int. Cl. F16j *15/52***
**U.S. Cl. 74—18.1** **10 Claims**



A rotary torsional shaft seal is provided, comprising an elastomeric annular seal, which is clamped to both a rotatable shaft and also to a stationary housing member, and having a non-frictional resisting flange portion to prevent deterioration of the elastomeric seal. To provide a hermetic torsional rotary shaft seal, preferably the seal is chemically bonded to both the shaft and also to the container housing. Additionally, a collar having a non-frictional surface is preferably secured to the rotatable shaft to prevent binding between the elastomeric flange portion of the seal and the interface between the shaft and the housing at the clearance opening therebetween.

A modification of the rotary shaft seal includes one or more convolutions of the elastomeric seal with friction resisting collars disposed between the convolutions. As in the first mentioned construction, a chemical bonding between the seal and the shaft and also the housing is preferably provided.

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**3,744,325**

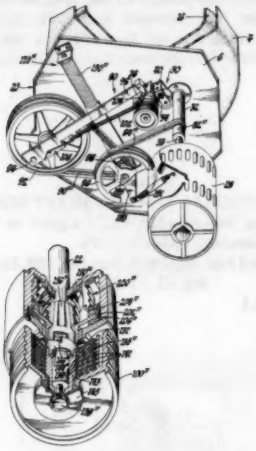
## AGITATING AND SPINNING DRIVE MECHANISM FOR A CLOTHES WASHER

**Byron L. Brucken, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 95,626, Dec. 7, 1970, abandoned, which is a division of Ser. No. 798,298, Feb. 11, 1969, Pat. No. 3,584,482. This application Mar. 6, 1972, Ser. No. 232,175**
**Int. Cl. F16h *21/90*; F16d *11/10***
**U.S. Cl. 74—82** **20 Claims**

A dry-type roller drive mechanism for the agitator and spin tub of a washing machine has a reversible motor utilized to rotate a driven spin roller through a friction drive including a self-energizing roller and to oscillate a slider crank drum through an improved slider crank drive, and wherein a clutch mechanism including the slider crank drum is utilized upon the direction of rotation of the reversible motor to selectively

impart to the agitator the oscillatory motion of the slider crank drum during a washing cycle and to the spin tub through the



self-energizing roller the rotary motion of the driven spin roller during a spin cycle.

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**3,744,326**

**MOTION TRANSFORMER**

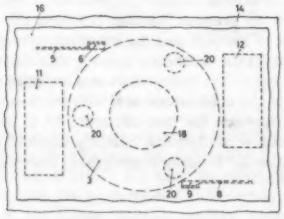
**Max Hetzel, and Pierre Waibel, both of Bienne, Switzerland, assignors to Omega Louis Brandt Et Freres, S.A., Bienne, Switzerland**

**Filed Apr. 17, 1972, Ser. No. 244,770**

**Claims priority, application Switzerland, Apr. 27, 1971, 6129/71**

**Int. Cl. F16h** *27/02*

**U.S. Cl. 74—128** **15 Claims**



In a motion transformer for converting oscillatory to rotary motion, comprising (a) an enclosure including a base plate and a cover plate, (b) a ratchet wheel within the enclosure mounted for both oscillatory and rotary motion, (c) a pair of stops limiting the amplitude of such oscillatory motion, (d) a ratchet pawl and a restraining member coacting with the ratchet wheel to convert oscillatory motion thereof to unidirectional rotary motion, and (e) magnetic coupling means attracting the ratchet wheel toward the enclosure base member, provision is made in the form of at least three hard support members for supporting the ratchet wheel in spaced relation with the base plate. Such support members, which preferably are of jewel stone or equivalent hard material, are movable relative to either the ratchet wheel or the base plate, or both, to permit the oscillatory and rotary motion of the ratchet wheel relative to the base plate, and they bear with very small nearly point contact area against the surface on which they move.

**3,744,327**

**MOTION TRANSFORMER**

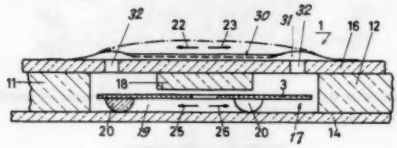
**Max Hetzel, Bienne, Switzerland, assignor to Omega Louis Brandt Et Freres, S.A., Bienne, Switzerland**

**Filed Apr. 24, 1972, Ser. No. 246,580**

**Claims priority, application Switzerland, May 5, 1971, 6688/71**

**Int. Cl. F16h** *27/02*

**U.S. Cl. 74—128** **10 Claims**



In a motion transformer for converting oscillatory to rotary motion, comprising (a) an enclosure including a base plate, a cover plate, and side members, all of which are substantially rigid, (b) a ratchet wheel within the enclosure mounted for both oscillatory and rotary motion, (c) a pair of stops limiting the amplitude of such oscillatory motion, (d) a ratchet pawl coacting with the ratchet wheel and a restraining member preventing retrograde rotation thereof to convert oscillatory motion thereof to uni-directional rotary motion, and (e) a liquid filling the space in said enclosure, a variable volume sealing chamber is bonded to the enclosure so as to hermetically seal the liquid in the enclosure and yet yield to thermal expansion and contraction of said liquid. The side members of the enclosure are preferably configured to fit in closely spaced relation about the ratchet wheel, to minimize the volume of the chamber within the enclosure.

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**3,744,328**

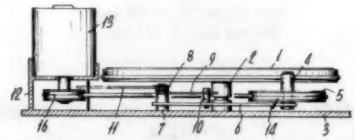
**DRIVE MECHANISM FOR PORTABLE RECORD PLAYERS**

**Nardino Righi, Via Maniago, 2, Milan, Italy**

**Filed Sept. 14, 1970, Ser. No. 71,657**

**Int. Cl. F16h** *13/02*

**U.S. Cl. 74—209** **3 Claims**



A device to maintain constant the speed of rotation of the turntable of a portable record player, consisting of a rotating disc or flywheel pressing against the circumference of the turntable, the flywheel being pivotted on the end of a moveable arm which is subject to the pressure of a flexible device which forces the above-mentioned flywheel against the turntable.

The flywheel is driven, through a transmission, by the appropriate motor of the record player.

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**3,744,329**

**MODULAR PULLEY CAPABLE OF BEING ASSEMBLED TO VARIOUS DESIRED LENGTHS AND AUTOMATIC BELT-STEERING PULLEY ASSEMBLY**

**Carl A. Frank, 624 Stanley Place, River Vale, N.J.**

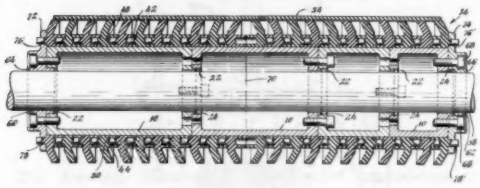
**Continuation of Ser. No. 35,400, May 7, 1970, abandoned. This application June 9, 1972, Ser. No. 261,510**

**Int. Cl. F16h** *55/42, 7/18*

**U.S. Cl. 74—230.1** **12 Claims**

A modular pulley capable of being assembled to various desired lengths and automatic belt-steering pulley assembly.

The modular pulley includes a plurality of interconnected hub units each having a cylindrically shaped body portion with male and female end surfaces integrally connected therewith. Each end surface has an axially aligned opening extending therethrough which is capable of receiving a shaft. One of the end surfaces has a male portion extending outwardly surrounding and adjacent to the opening. The other end surface has a female portion extending inwardly surrounding and adjacent to the other axially aligned opening. Further, the end surfaces have axially aligned fastening holes arranged therein for the interconnection of individual hub units with the male



portion of one hub mating with the female portion of the preceding hub. The adjacent hubs are then bolted together to form an assembled pulley, with the tool doing the bolting gaining access to the bolt through another axially aligned hole. The assembled hub units provide a "flat," i.e. cylindrical pulley or roller of the desired length for use with a belt. When it is desired to provide automatic belt-steering action, end plates are mounted to the respective end hub units to form the ends of the pulley between which are mounted a plurality of resilient interlocking rings having effectively inclined peripheral ribs which are resiliently deflectable and serve to automatically center a belt passing over the pulley assembly.

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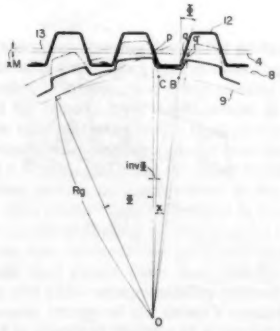
**3,744,330**

**GEARWHEEL ADAPTED TO DRIVE A POSITIVE MOTION BELT HAVING ELASTIC TEETH**

**Yoshiaki Sugimoto, Tokorozawa, Japan, assignor to Tsubakimoto Chain Co., Ltd., Joto-ku, Osaka-shi, Japan**

**Filed Apr. 5, 1972, Ser. No. 241,249**
**Claims priority, application Japan, Apr. 5, 1971, 46/20932**
**Int. Cl. F16h *55/30*; F16g *1/28*; F16h *55/06***
**U.S. Cl. 74—243 R** **2 Claims**



A gear wheel is provided for engaging a positive motion belt in a power transmission device. The positive motion belt has elastic rectilinear teeth. The gear wheel is generated by a rectilinearly toothed gear cutter which has a cavity form having a pressure angle $\Phi$, an effective cavity thickness $L$ and a depth $H$ of the following values when the pressure angle and effective thickness and height of the tooth on said belt are $\phi$, $l$ and $h$, respectively:

$$\Phi \times \phi \; l \; (0.3° \; H \; 5°)$$

$$L = (1.01 \sim 1.08)l$$

$$H = (1.05 \sim 1.15)h$$

A gear wheel generated in this manner lengthens the life of the belt, reduces the noise and reduces the manufacturing cost of the gear wheel.

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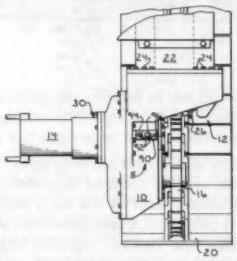
**3,744,331**

**DISCONNECT DEVICE**

**Samuel I. Caldwell, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Apr. 17, 1972, Ser. No. 244,413**
**Int. Cl. F16h *57/00*; F16d *21/04***
**U.S. Cl. 74—405** **24 Claims**



A disconnect device for a power train which has a pair of normally coupled rotary members, including an extension on one of said members which is coupled to, axially movable with, and freely rotatable within a portion of a disconnect rack, and which also includes an adjustable pinion for moving such rack axially so that the rotary member coupled thereto may be selectively positioned out of driving relationship with the other of the members.

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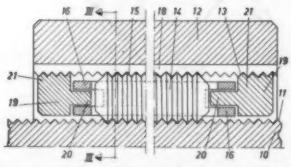
**3,744,332**

**SCREW AND NUT MECHANISM**

**Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Trading and Development Company N. V., Amsterdam, Netherlands**

**Filed Oct. 14, 1971, Ser. No. 189,201**
**Int. Cl. F16h *1/18***
**U.S. Cl. 74—424.8 C** **1 Claim**



In a screw and nut mechanism including transmission rollers the necessary displacement of the rollers one step backwards for each revolution of the nut with respect to the screw is brought about by at least one cam member, which operates between twin walls at the adjacent edge of cage, where the cam has a protected position and furthermore contacts the rollers about at their longitudinal axes.

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**3,744,333**

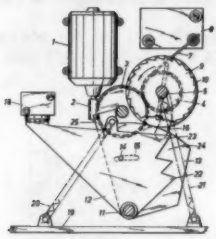
**DEVICE FOR CONNECTING AND DISCONNECTING ELECTRICAL OR MECHANICAL FUNCTIONS**

**Karl Johan Folke Hallberg, Egnahemsgatan 37, Varberg, Sweden**

**Filed May 1, 1972, Ser. No. 249,018**
**Claims priority, application Sweden, May 14, 1971, 5738/71**
**Int. Cl. F16h *55/04***
**U.S. Cl. 74—437** **5 Claims**

A device for connecting and disconnecting electrical or mechanical functions in a continuous sequence, comprising a

cam shaft the cam means of which bring about said connection and disconnection, respectively, upon rotation of the cam shaft. The cam shaft supports a toothed disc cooperating with a toothed segment rotatably mounted on a second shaft, running in parallel with the cam shaft, on which second shaft is also supported a disc element cooperating with a wheel



mounted on the cam shaft. Immediately upon rotation of the cam shaft, a tooth on the toothed segment will move the toothed disc for displacement of the cam shaft to operative position, wherein it switches on said functions. As soon as cam shaft rotation ceases, the toothed segment together with the disc element will bring the cam shaft back to its inoperative position of rest for disconnection of said functions.

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**3,744,334**

**NON-INTERFERING WATCH-CROWN GEAR AND PINION GEAR AND METHOD OF MANUFACTURE**

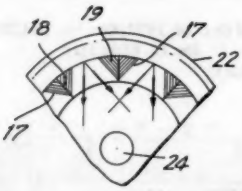
**Mamoru Miyasaka, Nagano-ken, Japan, assignor to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan**

**Filed Nov. 16, 1971, Ser. No. 199,163**

**Claims priority, application Japan, Nov. 18, 1970, 45/113868**

**Int. Cl. F16h** *55/06*

**U.S. Cl. 74—462** **5 Claims**




A watch-crown gear and a mating pinion gear have wedge-shaped teeth so oriented that upon moving the pinion gear to mesh with the crown gear, interference of the teeth of the pinion gear with the teeth of the crown gear cannot occur. The side faces of the crown gear teeth are so aligned that a side face on each of two teeth can be cut with a single pass of a tooth-cutter.

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**3,744,335**

**JOYSTICK TYPE CONTROL DEVICE WITH DISPLACEMENT FEEL**

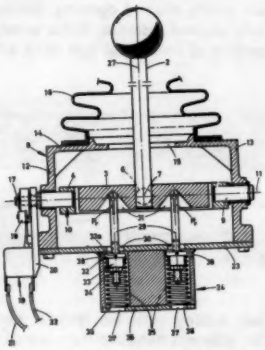
**Ake Gustav-Adolph Karlsson, and Bengt Furchtegott Staffan Svenning, both of Linkoping, Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden**

**Filed May 23, 1972, Ser. No. 256,012**

**Int. Cl. G05g** *9/04*

**U.S. Cl. 74—471 XY** **3 Claims**

The stick of a joystick type control device is rigidly affixed to a carrier plate that extends normal to it. The plate is gimbal mounted on a fixed base and has four reaction receiving elements equidistant from the stick axis, arranged two along each gimbal axis, at opposite sides of the stick. Four springs react, all in the same direction, between the fixed base and the plate,



one against each reaction receiving element. When the stick is in a normal position the springs exert equal forces.

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**3,744,336**

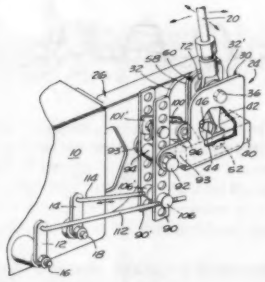
**MULTIPLE SPEED GEAR SHIFT**

**John T. Lancaster, Costa Mesa, Calif., assignor to The Fenton Company, Gardena, Calif.**

**Filed July 29, 1971, Ser. No. 167,276**

**Int. Cl. G05g** *9/12*

**U.S. Cl. 74—473 R** **4 Claims**



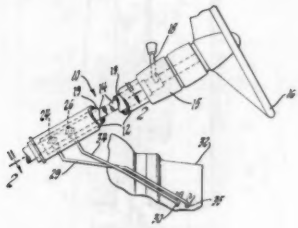
A multiple speed gear shift having a shifting handle that is movable laterally so its end part can engage in a recess in one of closely spaced parallel slide members. Interconnections are provided between the slide members and shift levers on a transmission. Pivoted apertured adaptor levers are provided as a part of the shift unit or as a separate accessory. The slide members attach by links to apertures in the adaptor levers and straight connecting links connect between other apertures in the adaptor levers and the shift levers on the transmission.

**3,744,337**

## TRANSMISSION CONTROL

**Robert C. Farrell, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed May 5, 1972, Ser. No. 250,731**
**Int. Cl. G05g 9/12**
**U.S. Cl. 74—484** **4 Claims**



The drawings illustrate a spring-loaded ratchet-type arrangement for adjusting the lower steering column-mounted shift levers.

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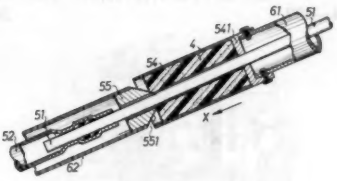
**3,744,338**

## ENERGY ABSORBING STEERING DEVICE

**Noboru Komatsu, and Toshio Kurauchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan**

**Filed Oct. 27, 1971, Ser. No. 193,006**
**Claims priority, application Japan, Oct. 31, 1970, 45/96014**
**Int. Cl. B62d 1/18**
**U.S. Cl. 74—492** **24 Claims**



An energy absorbing steering device for protecting vehicle drivers from the shock of impact against a steering wheel. Said device is provided with upper and lower steering shaft assemblies mounted for relative axial displacement in response to the application of axial forces, and a rigid plastic foam body. One of said assemblies includes a cylinder member having one open end and a bottom plate and the other includes a piston having a pushing surface inclined relative to the axis of said cylinder. The rigid plastic foam is disposed in the cylinder intermediate the inclined pushing surface and the bottom plate for compression upon such relative axial displacement of said assemblies. Said rigid plastic foam body has the property of relatively long and stable compressibility without spring back so that the kinetic energy of the driver's impact against the steering wheel is absorbed thereby at a predetermined load level.

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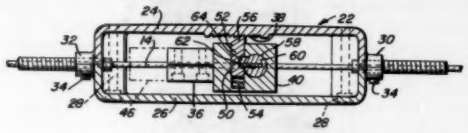
**3,744,339**

## ADJUSTABLE CABLE STOP

**Arne I. Martinson, Twin Valley, Minn.**

**Filed Aug. 18, 1971, Ser. No. 172,730**
**Int. Cl. F16c 1/10**
**U.S. Cl. 73—501 R** **8 Claims**

A bowden cable adjustable stop assembly for adjustably limiting the movement of a bowden cable core in one direction relative to the outer housing of the bowden cable. A mid-portion of the bowden cable housing is omitted and a lock housing is connected in line between the adjacent ends of the bowden cable housing end sections with the end sections retained against longitudinal shifting relative to the lock housing and the bowden cable core extending through the housing and having an abutment member attached thereto against longitudinal shifting along the core. A limit stop is slidably supported from the housing for rectilinear movement along a path



generally paralleling the portion of the bowden cable core extending through the housing and the abutment member is engageable with the limit stop to limit movement of the cable core in a direction shifting the abutment member toward the adjacent side of the limit stop. Further coacting latch means carried by tye limit stop and the lock housing are provided and include key operable actuating means for releasably securing the limit stop in adjusted shifted position relative to the housing, whereby the limit of movement of the core of the bowden cable in one direction may be adjusted.

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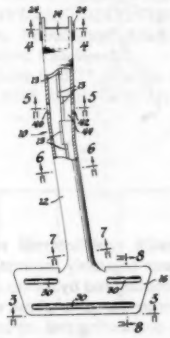
**3,744,340**

## STAMPED BRAKE PEDAL

**Raymond R. Peterson, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 10, 1972, Ser. No. 242,654**
**Int. Cl. G05g 1/14**
**U.S. Cl. 74—560** **2 Claims**



A one piece stamped brake pedal is provided having a tubular lever, an integrally stamped clevis at one end of the tubular lever providing a pivot by which the lever may be pivotally attached to the vehicle body, an integrally stamped pedal pad at the other end of the tubular lever, and a stamped pivot in the tubular lever intermediate the pedal pad and the clevis for attachment of the brake actuating push rod.

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**3,744,341**

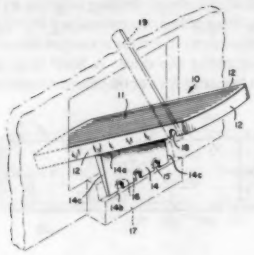
## FOOT PEDAL

**Harold B. Martin, Roselle, and Herman O. Rogg, Watchung, both of N.J., assignors to Graber-Rogg Inc., Cranford, N.J.**

**Filed Dec. 1, 1971, Ser. No. 203,578**
**Int. Cl. G05g 1/14**
**U.S. Cl. 74—561** **8 Claims**

A foot pedal comprised of a single molded body having an integral connecting flex member extending downwardly therefrom which is capable of being attached to a mounting.

Upon an application of force to the pedal to operate an external member connected thereto, the flex member is temporari-



ly placed under stress and flexes concavely towards the horizontal, the pedal automatically returning to its normal resting position upon a removal of the applied force.

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**3,744,342**

**RECIPROCATING PISTON TYPE ENGINES HAVING WEIGHTS FOR BALANCING PRIMARY INERTIAL FORCES**

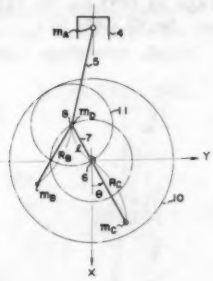
**Haruo Kinoshita, Hamamatsu-shi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-ken, Japan**

**Filed Sept. 27, 1971, Ser. No. 184,113**

**Claims priority, application Japan, Oct. 2, 1970, 45/98096**

**Int. Cl. F16f** *15/26*

**U.S. Cl. 74—604** **6 Claims**



A reciprocating piston type internal combustion engine comprising a small gear rotatably mounted between one of crank arms and a connecting rod by means of a pivot provided on said one crank arm in the same phase as a crank-pin and projecting toward the connecting rod, an internal gear having a number of teeth twice that of said small gear and fixedly mounted on the inner wall of a crankcase in meshing engagement with said small gear, a rotating balance weight provided on said small gear in such a way that it is in its lower position when the crank-pin is in the top dead center, and a revolving balance weight provided on the crank arms on the side opposite to the crank-pin with respect to crank journals.

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**3,744,343**

**ELASTIC PLUG-TYPE PIPE CONNECTION**

**Josef Helmer, Aich Kr Nurtingen, and Georg Eltze, Stuttgart-Riedenberg, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

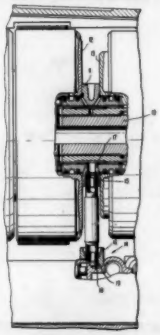
**Filed Mar. 30, 1971, Ser. No. 129,533**

**Claims priority, application Germany, Apr. 1, 1970, P 20 15 411.4**

**Int. Cl. F16h** *47/00*

**U.S. Cl. 74—645** **10 Claims**

An elastic plug-type pipe connection for the pressure medium in transmission parts, especially a connection between the shifting plate of an automatic motor vehicle transmission and of a distributor member associated with the shaft of the transmission, in which a bush serving as distributor member is mounted on the shaft and is secured against rotation; a connecting pipe section is provided at both ends with elastic seal-



ing bushes and is inserted with the latter into essentially funnel-shaped apertures at the shifting plate and at the oil distributor bush until the end faces of the elastic sealing bushes abut sealingly against the corresponding surfaces of the apertures.

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**3,744,344**

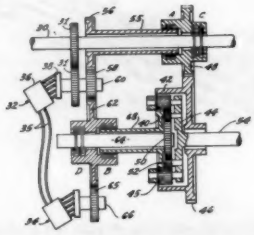
**CONTROL SYSTEM FOR TRANSMISSION**

**Gerald N. Olsen, Torrance, and Arthur R. Washburn, Anaheim, both of Calif., assignors to White Motor Corporation, Cleveland, Ohio**

**Filed Dec. 7, 1970, Ser. No. 95,820**

**Int. Cl. F16h** *47/04, 5/06*

**U.S. Cl. 74—687** **24 Claims**



An engine drives a vehicle through a transmission that incorporates clutches and planetary gearing together with a hydraulic drive unit that variably and reversibly drives a reaction component of the planetary gearing for stepless changes through a series of ranges of vehicle speed. The driver shifts a control handle through positions corresponding to the series of ranges and a control system for the transmission includes servo-means that operates at a predetermined rate to automatically vary the hydraulic drive unit and to engage the various clutches in accord with the changing positions of the control handle.

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**3,744,345**

**CHANGE GEAR TRANSMISSION FOR MOTOR VEHICLES**

**Heinz Keienburg, Cologne, and Wilhelm Jansen, Bensberg-Refrath, both of Germany, assignors to Klockner-Humboldt Deutz Aktiengesellschaft, Cologne-Deutz, Germany**

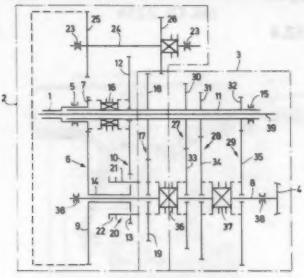
**Filed Apr. 12, 1972, Ser. No. 243,180**

**Int. Cl. F16h** *3/02*

**U.S. Cl. 74—745** **22 Claims**

A change gear transmission comprising groups of gears for motor vehicles, especially tractors, in which between a gear

pair driven by the input shaft of an auxiliary transmission or driving the output portion of the auxiliary transmission, on one hand, and the gear pair, on the other hand, there is arranged an additional gear pair which comprises a gear freely rotatable on the counter shaft of a main transmission group



and adapted selectively to be coupled to the counter shaft, a gear pair being provided which is adapted selectively directly or indirectly to be coupled to a coaxial gear which forms a part of the velocity range of the main transmission group and pertains to the auxiliary transmission.

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**3,744,346**

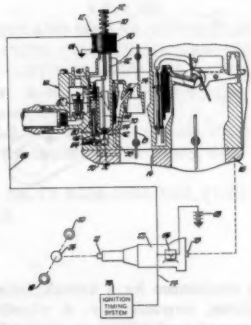
**TRANSMISSION CONTROLLED POWER ENRICHMENT OVERRIDE APPARATUS**

**Hugh L. Miner, Grand Blanc; Howard E. Chana, Flint, and Albert L. Thompson, Grand Blanc, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 17, 1972, Ser. No. 235,708**

**Int. Cl. B60k** *21/00;* **F02m** *7/20;* **F02d** *9/00*

**U.S. Cl. 74—860** **7 Claims**



A switch is closed by an automatic transmission when in a high drive ratio to operate a solenoid that positions a fuel metering rod in the fuel delivery passage of a carburetor to effect a minimum flow area through a metering orifice. This overrides the normal operation of the carburetor power enrichment system that otherwise increases the flow area as the engine vacuum falls.

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**3,744,347**

**SHIFT CONTROL SYSTEM FOR ENGINE MOUNTED AUTOMOBILE AUTOMATIC TRANSMISSIONS**

**Seitoku Kubo; Takakazu Mori, and Chihiro Hayashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan**

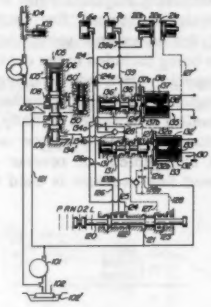
**Filed May 19, 1971, Ser. No. 144,926**

**Claims priority, application Japan, May 22, 1970, 45/43769**

**Int. Cl. B60k** *21/00*

**U.S. Cl. 74—866** **5 Claims**

A shift control system for engine mounted automobile automatic transmissions comprising a low speed forward drive ratio one-way clutch provided to obtain the required gear shifting engagement of a gear train, friction engagement means with hydraulic servo units for providing intermediate speed and high speed forward ratios, and electro-hydraulic control means for generating electrical signals corresponding to the driving conditions of the automobile to control the



operations of the one-way clutch and the friction engagement means, whereby when the automobile is driven with the engine output torque lower than a predetermined value, a shift is effected directly from the high speed forward drive ratio to the low speed forward drive ratio to permit the automobile to coast at the low speed forward drive ratio under the overrunning condition.

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**3,744,348**

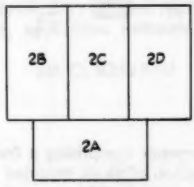
**PLANETARY TRANSMISSION MECHANISM AND HYDRAULIC CONTROL**

**Robert W. Lemon, Framington, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed June 1, 1971, Ser. No. 148,558**

**Int. Cl. B60k** *21/00;* **F16d** *25/10, 11/00*

**U.S. Cl. 74—869** **10 Claims**




An automatic transmission mechanism including a planetary gear train and a hydraulic control mechanism adapted to control engagement of friction engaging devices for establishing various drive ratios through the gear train. The planetary transmission including first and second clutch mechanisms, a one-way brake mechanism to establish low gear ratio and a one-way brake mechanism to establish second gear ratio, the engagement of both said clutch mechanisms providing a 1:1 direct drive ratio. A friction brake mechanism is provided in parallel with each of said one-way brake mechanisms to provide first and second two-way drive ratios through the transmission mechanism. One of the clutch mechanisms includes a double hydraulic servomotor arrangement whereby a minimum engaging force can be utilized for one of the clutches, for direct drive to provide for a smooth shift to direct drive and whereby when reverse ratio is established utilizing

the same clutch mechanism both hydraulic servomotors for the clutch can be actuated to provide the high engagement force required for reverse drive. A double hydraulic servomotor also is provided for the friction brake mechanism for low drive ratio whereby a single one of said servomotors can be utilized for low drive ratio and both servomotors can be utilized to engage the same brake mechanism for reverse ratio when a higher engaging force is required. The hydraulic control mechanism including engine torque and vehicle speed responsive accumulator devices for each of the clutch mechanisms and for a second speed brake mechanism. Sequencing valves being included in the control mechanism to insure that when reverse drive ratio is being established only one of the servomotors in the clutch mechanism and the low gear brake mechanism is actuated initially, the second servomotor being actuated by said sequence valves thereafter to enable a smooth engagement of reverse drive ratio even though an increased line pressure is used for reverse drive ratio.

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**3,744,349**

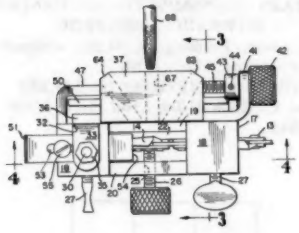
**CHAIN SAW SHARPENER**

**Arnold A. Juncker, R.R 2, Box 244, Mount Vernon, Ind.**

**Filed Apr. 6, 1972, Ser. No. 241,730**

**Int. Cl. B23d** *63/10, 63/16*

**U.S. Cl. 76—25 A** **10 Claims**



A chain saw sharpener comprising a frame to straddle a cutter bar and a section of chain mounted thereon, a clamp screw to secure a chain tooth temporarily relative to the frame, clamp screws to secure the frame to the cutter bar, a guideway in the frame to guide the chain for movement relative to the first clamp screw to bring teeth successively into cooperative relation with the clamp screw, a carriage supported from the frame for adjustable movement relative to the frame in the direction of length of the cutter bar and in a direction transverse relative to the cutter bar, and a stop projecting into the path of travel of the teeth to establish a fixed working position for any tooth to be treated, the carriage being formed with a first guide bore to pass and guide a round file in a position to sharpen left-hand teeth engaging the stop and held by the first clamp screw, a second guide bore to pass and guide the same file in a position to sharpen right-hand teeth engaging the stop and held by the first clamp screw, and a third guide bore to pass and guide the same file in a position to shorten the depth gage of either a left-hand tooth or a right-hand tooth engaging the stop and held by the first clamp screw.

**3,744,350**

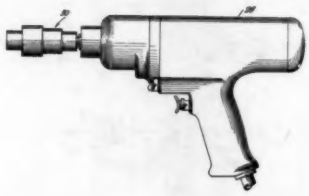
**IMPACT WRENCH TORQUE LIMITING DEVICE**

**Samuel J. Raff, Silver Spring, Md., assignor to Raff Analytic Study Associates, Incorporated, Silver Spring, Md.**

**Continuation of Ser. No. 766,770, Oct. 11, 1968, abandoned. This application Mar. 11, 1971, Ser. No. 123,433**

**Int. Cl. B25b**

**U.S. Cl. 81—52.4** **10 Claims**



An impact wrench torque limiting device having a socket member and a coaxially disposed impact wrench drive receiving member associated therewith. A resilient member connects the socket member to the drive receiving member to limit torque transmitted between the socket member and drive receiving member.

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**3,744,351**

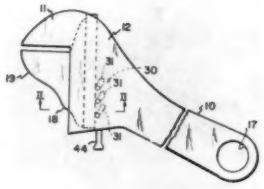
**ADJUSTING MECHANISMS FOR WRENCHES**

**Herman A. Myers, Lake Lynn, Pa., assignor to Insta-Snap Corp., Monongahela, Pa.**

**Filed Aug. 30, 1971, Ser. No. 175,966**

**Int. Cl. B25b** *13/12, 13/24*

**U.S. Cl. 81—129** **9 Claims**



An adjusting mechanism for a wrench having a stationary jaw and a slidable, movable jaw. A plurality of inclined notches are recessed preferably into the surface of the stationary jaw over which the movable jaw slides. A roller is positioned in each notch and a slider is positioned in a chamber which connects the notches to move the rollers along the inclined notches. Spring means are utilized between the rollers and the slider and between the slider and the stationary jaw member. Locking is achieved through the wedging action of the rollers between the inclined surfaces and the movable jaw.

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**3,744,352**

**BORING AND FACING APPARATUS**

**Jule A. Scholl, 41-31 51st. St., Woodside, N.Y.**

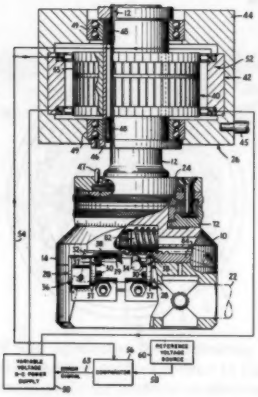
**Filed Mar. 23, 1971, Ser. No. 127,136**

**Int. Cl. B23b** *43/00*

**U.S. Cl. 82—1.2** **10 Claims**

A cutting tool is carried by a carriage which is slidably engaged by a rotatable body connected to a drive shaft so that the body and carriage rotate together to perform boring and facing operations. The rotational movement of the body relative to a reference member produces transverse sliding movement of the carriage relative to the body, thereby increasing

the diameter of the circular path followed by the cutting tool. The ratio of transverse movement of the carriage to rotational movement of the body can be altered by rotating the reference member. A mechanism which includes a plurality of carriage



stops is provided for arresting the transverse movement of the carriage. This mechanism is indexed by the movement of the carriage to bring successive stops into operative position in sequence.

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**3,744,353**

**METHOD AND MEANS FOR PREVENTING REGENERATIVE CHATTER IN A MACHINE TOOL, PARTICULARLY IN A LATHE**

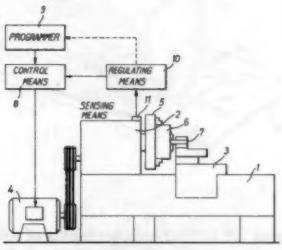
**Hans Gunther Rohs, 9 Richard-Wagner-strasse, 7324 Rechberghausen, Germany**

**Filed Aug. 13, 1971, Ser. No. 171,585**

**Claims priority, application Germany, Aug. 25, 1970, P 20 42 138.9**

**Int. Cl. B23b** *3/00, 7/00, 19/02*

**U.S. Cl. 82—2 R** **7 Claims**




**The invention relates to a method for suppressing regenerative chatter of the kind which occurs during the machining of workpieces by a tool of a machine tool, said method consisting of changing repeatedly the cutting speed of the tool whilst the latter machines the same surface of the workpiece, thereby making the frequency with which the waves or ripples on the surface which is being machined impact on the tool dissimilar to the inherent frequency of the mass system on which the cutting force acts, so that these waves or ripples when impacting on the tool do not increase the amplitude of the vibrations which product chattering. Moreover the invention relates to a machine tool for carrying out such method, more particularly to a lathe.**

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**3,744,354**

**AUTOMATIC LATHES**

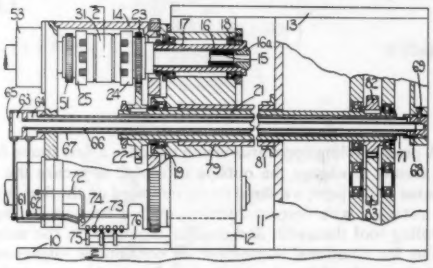
**Harold James Gilbert, Coventry, Warwickshire, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England**

**Filed Jan. 19, 1971, Ser. No. 107,706**

**Claims priority, application Great Britain, Jan. 31, 1970, 4,793/70**

**Int. Cl. B23b** *3/34*

**U.S. Cl. 82—3 R** **7 Claims**



**A multi-spindle automatic lathe having drive mechanisms for work spindles, the drive mechanisms incorporating at least one hydraulically actuated clutch whereby drive can be engaged and disengaged when required the drum on which the spindles are mounted having means whereby the clutches can be actuated.**

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**3,744,355**

**MULTIPLE SPINDLE LATHE**

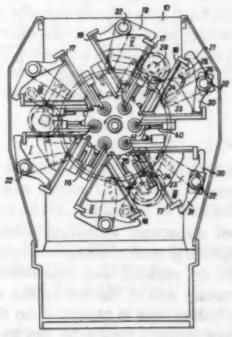
**Hermann Flisch, Maienfeld, Switzerland, assignor to Eunipp AG, Zug, Switzerland**

**Filed Nov. 27, 1970, Ser. No. 93,072**

**Claims priority, application Switzerland, Dec. 3, 1969, 18102/69**

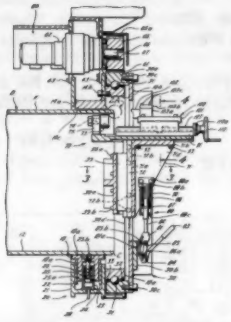
**Int. Cl. B23b** *9/00*

**U.S. Cl. 324** **12 Claims**



**Multiple spindle automatic lathe having two tool slides associated with each spindle position for radial movement relative the spindle axis.**

3,744,356
**PIPE BEVELING APPARATUS**
Damon T. Slator, and Daniel G. Shaw, both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.
Filed Oct. 12, 1971, Ser. No. 188,391
Int. Cl. B23b 3/22
U.S. Cl. 82—4 C 19 Claims



A pipe beveling apparatus which includes a first frame having means to engage the outside of a pipe to secure the apparatus to the pipe; a second frame mounted on the first frame for rotation with respect thereto; and, a support having a beveling tool therewith and a roller mounted on the second frame for rotational movement in continuous engagement with the inside of the pipe as the beveling tool is moved about thepipe to precisely shape the end of such pipe for subsequent use as part of a welding groove.

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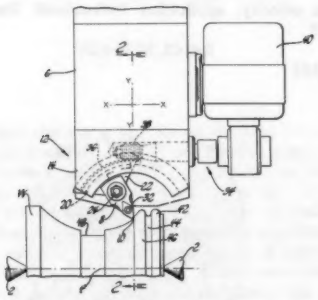
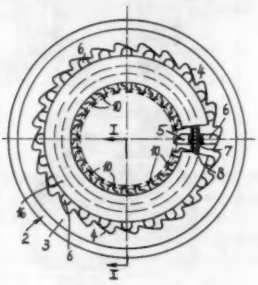
3,744,357
**PROFILE CUTTING TOOL**
Marvin R. Anderson, Grosse Pointe Shores, and Harald N. Jungesjo, Rochester, both of Mich., assignors to Anderson-Cook Incorporated, St. Clair Shores, Mich.
Filed Sept. 27, 1971, Ser. No. 184,155
Int. Cl. B23b 5/40
U.S. Cl. 82—12 2 Claims



Machine tool apparatus including workpiece supporting means for supporting and rotating a workpiece, and a tool holder movable in parallel and transverse directions with respect to the rotary axis of the workpiece supporting means. A cutting or grinding tool is mounted on the tool holder for selective rotation about a tool axis, the tool having a workpiece engaging portion located on the tool axis so that the tool can extend perpendicularly to the surface of a workpiece regardless of the contour of the workpiece as the tool holder moves the tool along the length of the workpiece.

3,744,358
**SCALPING MACHINE**
Wolfgang Lindemann, Aachen, Germany, assignor to Orbit Beratungsgesellschaft m.b.H., Aachen, Germany
Filed Mar. 11, 1971, Ser. No. 123,165
Claims priority, application Germany, Mar. 16, 1970, P 20 12 324.4
Int. Cl. B23b 5/12
U.S. Cl. 82—20 8 Claims



A scalping machine with a nonrotatable workpiece which is fed through a revolving cutter head in which the cutters are not only adjustable in radial directions relative to the workpiece but also so as to vary the angle of their cutting edges relative to a plane extending at right angles to the axis of the workpiece.

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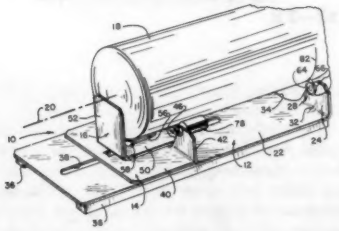
3,744,359
**APPARATUS FOR CUTTING GLASS BOTTLES AND THE LIKE**
Ephrem J. Gelfman, P. O. Box 3443, Boulder, Colo.
Filed May 4, 1972, Ser. No. 250,288
Int. Cl. B26d 3/08; B26f 3/06
U.S. Cl. 82—92 11 Claims



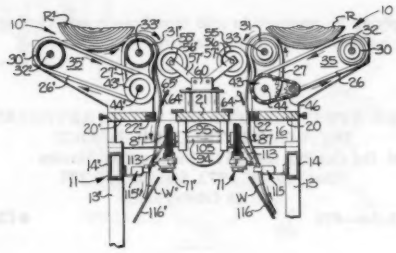
An apparatus for cutting hollow objects of substantially circular cross-section, such as glass bottles, includes a base structure having a first set of laterally spaced support members at one end with one of the support members defining a cutting edge for forming a score line in an object rotated on the base structure. Spaced longitudinally from the one end of the base structure is a second set of laterally spaced support members which are mounted on a support plate that is disposed for longitudinal sliding movement along the base structure between fixed positions whereby the spacing between the first and second set of support members can be adjusted. A stop plate is mounted adjacent the second set of support members for longitudinal movement relative thereto and relative to the first set of support members.

**3,744,360**

## METHOD AND APPARATUS FOR DISPENSING CELLULAR WEB MATERIAL

**Grover C. Currie, and Brendan L. Doll, both of Patterson, N.C., assignors to Cellu Products Company, Patterson, N.C.**

**Filed Feb. 22, 1971, Ser. No. 117,366**
**Int. Cl. B65h *35/04***
**U.S. Cl. 83—23** **6 Claims**



A method of and apparatus for dispensing web material, especially cellular padding such as is used in packaging furniture and the like, wherein the material is directed downwardly in suspended condition from a source past an elongate stationary knife. Upon a predetermined length of the material falling past the knife, an anvil roller is traversed automatically along the knife, with the web material interposed therebetween, so that the anvil roller presses the material against the knife, causing the same to sever a predetermined length from the web material.

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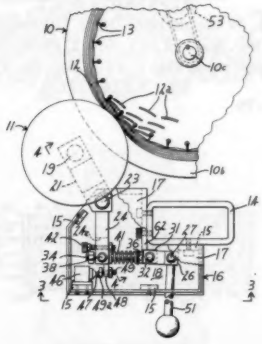
**3,744,361**

## PROCESS AND APPARATUS FOR CUTTING ELONGATED MATERIAL

**Donald W. Van Doorn, and James B. Hawkins, both of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.**

**Filed Feb. 8, 1971, Ser. No. 113,124**
**Int. Cl. B26d *1/36*, *1/40***
**U.S. Cl. 83—37** **11 Claims**



A process and apparatus for cutting elongated material into shorter, predetermined lengths which is an improvement upon the same shown, described and claimed in U.S. Pat. No. 3,485,120, issued Dec. 23, 1969. The present process includes the steps of determining the existence of more than a predetermined cutting pressure exerted on the material in order to ascertain if the machine is operating properly and, additionally, to use such increase in pressure to stop the cutting operation as when the cutting blades become dull, when knots pass through the apparatus, or upon improper installation of a cutter, and so forth. The apparatus includes means to exert a cutting pressure against the material and means quickly to move said pressure means into and out of operative position when desired.

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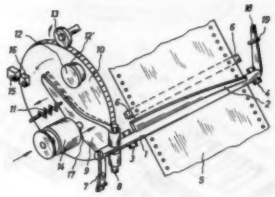
**3,744,362**

## SHEARING DEVICE FOR WEB STRIPS

**Reinhard Gesell, Haferberg; Wolfgang Dinse, Kiefernweg; Klaus Clement, Pruene, and Manfred Peters, Projensdorfer Strasse, all of Germany, assignors to Dr.-Ing. Rudolf Hell, Kiel, Germany**

**Division of Ser. No. 829,507, June 2, 1969, Pat. No. 3,568,556.**
**This application Sept. 21, 1970, Ser. No. 73,686**
**Claims priority, application Germany, June 4, 1968, P 17 61 538.2**
**Int. Cl. B26d *5/00***
**U.S. Cl. 83—62** **5 Claims**



A web cutting device and particularly a device for cutting photographic film strips at predetermined intervals as the strip moves through the cutting device. The apparatus includes a stationary shear blade and a rotatable shear blade which is mounted on a torsion bar. An actuation lever is fixed to the torsion bar and deployed perpendicularly thereof adjacent to the surface of a rotating inertial disk. The actuation lever is pivotable about an axis perpendicular to the axis of the torsion bar, and a solenoid device is used to pivot the actuation lever toward and away from the moving disk. A cam member is mounted on the disk so that it contacts the actuation lever and twists the torsion bar when the actuation lever is moved toward the disk. Switch means are provided to assure that the actuation lever is moved toward the disk at the proper time interval with respect to the position of the cam on the rotating disk, and means are provided to release the actuation lever once during every cycle of the disk. The torsion bar has an alarm control cam mounted at one end thereof, and a pair of switches are operated by movement of the alarm control cam to trigger an alarm when either the cam does not reach its terminal position or when the cam does not return to its starting position prior to the lapse of a given time interval. This assures that an alarm will be triggered if the web of material is not properly cut or if the device becomes jammed.

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**3,744,363**

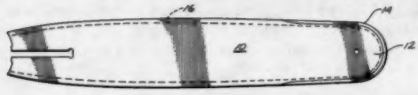
## HARD FACED CHAIN SAW GUIDE BAR

**Salvador Espana, San Pedro, Calif., and Brunson Bert Font, Lake Havasu City, Ariz., assignors to McCulloch Corporation, Los Angeles, Calif.**

**Continuation of Ser. No. 852,587, Aug. 25, 1969, abandoned.**
**This application Oct. 4, 1971, Ser. No. 186,438**
**Int. Cl. B27b *17/02***
**U.S. Cl. 83—743** **7 Claims**

The nose of a chain saw blade is radiused along its edges. The radiused nose is then grit blasted to roughen its surface and to remove any oxides. A first layer of particulate hard facing material is applied to the radiused nose and fused to obtain a metallurgical bond between the nose and the first layer. A

second layer of hard facing is then welded to the prepared first layer with an inert gas shielded arc process without marked penetration into the nose's parent material. The hard facing is then finished by grinding.



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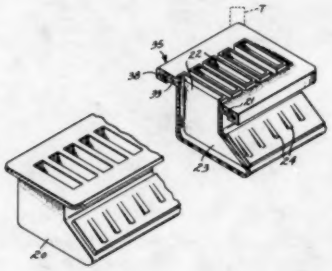
3,744,364

## CHORD ORGANS

Harold B. Martin, Roselle, and Herman O. Rogg, Watchung, both of N.J., assignors to Graber-Rogg, Inc., Cranford, N.J.

Division of Ser. No. 94,894, Dec. 3, 1970, Pat. No. 3,698,276.
This application July 21, 1972, Ser. No. 273,707
Int. Cl. G10b *3/00*
U.S. Cl. 84—360 5 Claims



In an improved chord organ of the type which includes base and keyboard sections having corresponding reed assemblies provided with openings that are normally closed by extending pallets of keys operative by a user, a spring device is provided for normally urging the key pallet against its reed assembly opening. The spring device includes a plastic unitary body having a plurality of compression fingers extending therefrom for contact with the pallets, there being relative sliding movement between the fingers and their respective pallets during movement of the pallets between open and close positions with their reed assembly openings. The organ also features an improved gasket for each reed assembly, said gasket including a plastic unitary body which is located over the top of the reed assembly and possessing an inherent tacky surface for adhering thereto. The organ also features a tonal device which includes a single molded plastic body having a plurality of uniquely arranged pivotally mounted baffle plates located adjacent the sound slots of the organ, said plates being movable with respect to the slots to cause the tonal sounds emanating therefrom to range between a brassy and muted quality.

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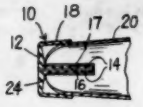
3,744,365

## MOUTHPIECE FOR WIND MUSICAL INSTRUMENT

John Kordula, 322 Plantation Road, Palm Beach, Fla.

Filed May 19, 1972, Ser. No. 254,947
Int. Cl. G10d *7/00*
U.S. Cl. 84—330 3 Claims

In a wind musical instrument having a mouthpiece having an elastic air tunnel formed of elastic means in sheet form, a method of varying the pitch of the sound produced by said instrument comprising widthwise stretching said elastic means by applying lip pressure to said mouthpiece and varying said stretching by varying said lip pressure.



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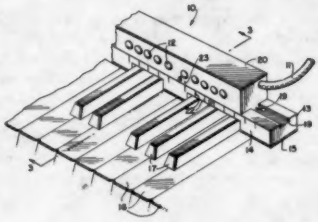
3,744,366

## INDICATING HEAD FOR USE WITH A KEYBOARD INSTRUMENT TEACHING DEVICE

Juan M. Del Castillo, Risco 119, Mexico City, Mexico

Filed Feb. 29, 1972, Ser. No. 230,287
Int. Cl. G09b *15/08*
U.S. Cl. 84—478 4 Claims



An indicating head which rests upon a keyboard on a section of the keys thereof which is adapted for use with a reading head. The indicating head extends over a portion of the keyboard and rests directly thereon with the portion containing pilot lights being adjustable for movement to position the lights over specific keys as desired helped by alignment markings on the device.

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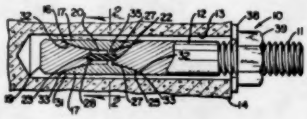
3,744,367

## EXPANSION BOLT

Lester Lerich, 30 Morningside Drive, Lakewood, Colo.

Division of Ser. No. 408,282, Nov. 2, 1964, abandoned. This application May 6, 1970, Ser. No. 47,927
Int. Cl. F16b *13/04*
U.S. Cl. 85—79 10 Claims



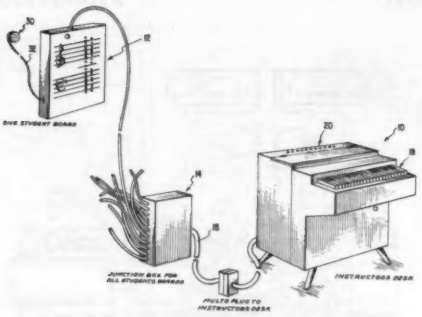
An expansion bolt comprising a shank having threads at one end and at least one longitudinally extending external groove in the other end of the shank. The groove is provided with an inclined portion and a relatively deep portion with an expansion means disposed within the shank in said groove to yieldingly urge a wedge member, disposed in said groove, outwardly into wedging engagement with the wall of an opening.

3,744,368

## MUSIC TEACHING DEVICE

Charles S. Lady, Niagara Christian College, Fort Erie, Ontario, Canada

Filed Aug. 10, 1972, Ser. No. 279,747
Int. Cl. G09b 15/00
U.S. Cl. 84—470 10 Claims



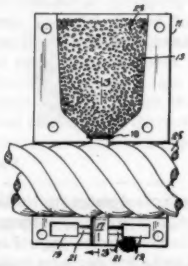
A music teaching device includes an instructor's keyboard and a number of student boards. The keys of the instructor's keyboard each have three positions, a normal position, a fully depressed position and an intermediate position and each student board includes a pushbutton switch corresponding to each key on the instructor's keyboard. When any instructor's key or keys is depressed a circuit is completed causing a tone or tones corresponding to such key or keys to sound over a speaker and when a depressed key is then released it assumes the intermediate position in which the speaker no longer sounds. The keys which are in an intermediate position may not be released except manually or until another key is depressed. When an instructor's key is either fully depressed or in an intermediate position, circuits are made so that actuation of a corresponding student's pushbutton will cause the corresponding tone to sound in the student's earphone. If a student depressed an incorrect pushbutton, an error lamp or indicator will light to apprise him of this fact and no tone will sound in the earphone. At the same tim, an error signal lamp corresponding to the student's board will light at the instructor's position.

3,744,369

## THERMITE CABLE CUTTER

Samuel J. Marziano, Glenolden, and John Revell, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 16, 1971, Ser. No. 163,162
Int. Cl. C06d 1/00
U.S. Cl. 89—1 B 2 Claims



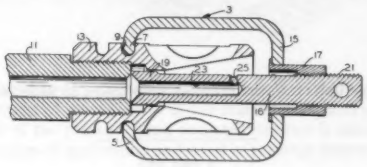
An apparatus and method for severing a steel cable comprising a housing having an upper reservoir and a lower work piece holder component, a flow gate extending downward from the reservoir through the work piece holder, port means positioned at the bottom of the housing, whereby on the ignition of the thermite mixture in the reservoir component, the resultant molten mass contacts the steel cable positioned in the work piece holder for a short period of time, thereby severing the cable.

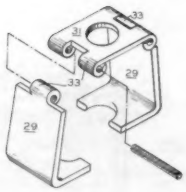
3,744,370

## BLANK FIRING ATTACHMENT

Robert E. Snodgrass, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 2, 1970, Ser. No. 120,150
Int. Cl. F41c 21/18; F41f 17/12
U.S. Cl. 89—14 E 3 Claims





An improved blank firing attachment is provided for automatic weapons comprising a frame with a rod-like restrictor adjustably mounted on the frame. The frame utilizes slotted means for engaging cooperating slots or shoulders associated with the muzzle end of the barrel. The restrictor is adjusted to bear against the end of the barrel to close the bore. An axial bore in the restrictor of smaller diameter than the barrel bore offers interference to a projectile inadvertently fired minimizing danger to personnel in the area. The restrictor bore is vented to gradually reduce gas pressures therein and in the barrel bore.

3,744,371

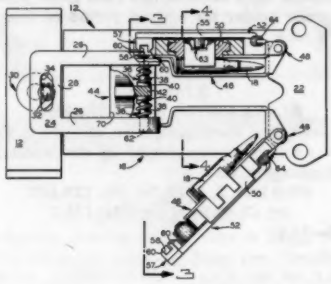
## SELECTIVE DUAL FEED MECHANISM

Larry C. McFarland, Silvis, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1971, Ser. No. 199,967
Int. Cl. F41d 9/00, 9/02
U.S. Cl. 89—33 SF 4 Claims

A dual feed mechanism for selectively feeding cartridges from one of two cartridge belts into a firearm receiver comprises a Scotch yoke which is reciprocated by a rotary crank and which carries in each of the two extending arms a laterally spring pressed pin. A switch is located between the two pins so that when displaced against either, that pin is pressed into engagement with a related bell crank for actuation thereof and the other pin is disengaged from a similar bell crank. Each of

the bell cranks is connected to a slide which is reciprocated thereby and which carries a pawl that moves one of the two



cartridge belts into the receiver responsive to slide reciprocation.

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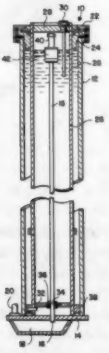
**3,744,372**

## SEMI-HYDRAULIC LIFT AND IMPROVED VALVE THEREFOR

**John Arthur Davis, Hebron, Md., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Mar. 29, 1972, Ser. No. 239,020**
**Int. Cl. F15b *21/04***
**U.S. Cl. 91—4 A** **7 Claims**



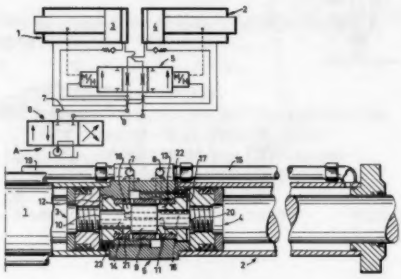
A low oil safety valve for use in semi-hydraulic lifts or hoists is disclosed herein. The improved valve includes a buoyant member that floats the valve in the lift hydraulic oil to hold the valve inoperative until the oil level in the lift drops below a predetermined, safe level. Attached to the lower end of the buoyant member is a seal member that includes an outer seal portion and an inner seal portion. The outer seal portion is engageable with the bottom plate of the lift plunger to prevent air and oil, when the oil level is below the predetermined safe level, from being discharged into the lift cylinder and thus causing erratic movement of the plunger. The inner seal portion encircles and sealingly engages an air line extending into the plunger to completely close the opening through the bottom plate of the hoist. The air line seal and the bottom plate seal are carried by the buoyant member, thus, both seals can be quickly and easily replaced without the necessity of removing the plunger from the cylinder as is usually necessary to replace the air line seal which is most often found in the bottom plate.

**3,744,373**

## HYDRAULIC DRIVING SYSTEM

**Tage Nils Wilhelm Leijon, Sturevagen 18, S-182 74 Stocksund, Sweden**

**Filed Oct. 12, 1971, Ser. No. 188,007**
**Claims priority, application Sweden, Feb. 10, 1971, 1680/71**
**Int. Cl. F01l *15/00, 33/00***
**U.S. Cl. 91—178** **4 Claims**



There is provided a hydraulic driving system having two independent driving cycles and comprising two double-acting piston-cylinder assemblies, each of the pistons of which have a specific starting position and is arranged to move from said position through the medium of an interlocking means only when the other piston occupies its starting position.

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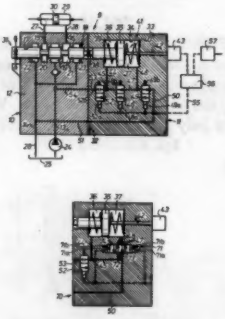
**3,744,374**

## HYDRAULIC VALVE CONTROL APPARATUS

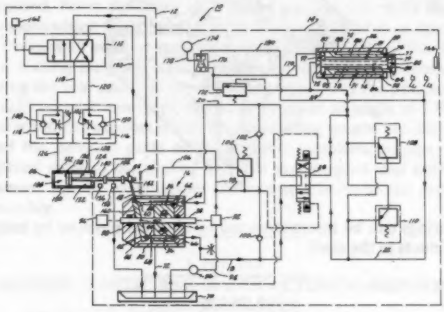
**Klaus Schneider, Ludwigsburg, and Heinz Flaschar, Aspberg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Mar. 13, 1972, Ser. No. 233,997**
**Claims priority, application Germany, Mar. 17, 1971, P 21 12 813.2**
**Int. Cl. F15b *9/03, 9/09***
**U.S. Cl. 91—363 R** **10 Claims**



A double-acting control piston for shifting the slider body of an operating valve, is movable in a control cylinder, forming first and second chambers in the control cylinder. A high pressure inlet conduit and a low pressure outlet conduit are selectively connected by distributing valve means with the first and second chambers, and an inlet valve, located in the inlet conduit upstream of the distributing valve means, is opened or closed by electric control means for starting and stopping the control piston means.

**3,744,375**
**FLUID SYSTEM**
**Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich.**
**Continuation-in-part of Ser. No. 50,093, June 26, 1970, Pat. No. 3,653,208. This application Aug. 9, 1971, Ser. No. 170,152**
**Int. Cl. F01b *31/00*; F15b *11/00***
**U.S. Cl. 91—411 A** **11 Claims**



A fluid system having a variable displacement fluid pump connected in a closed loop circuit to a fluid cylinder having a tubular member and a piston reciprocally mounted therein. The piston has a connecting rod extending from one side thereof and externally of the fluid cylinder. A second piston, fixedly attached to the tubular member, is reciprocally mounted within a blind bore in the connecting rod, with the outer face of the second piston and the blind end of the connecting rod defining an expansible pressure chamber. The effective pressure responsive areas of the two pistons are equal, such that when fluid at a selected rate of flow and at a predetermined pressure is communicated to the annular area on the rod side of the first piston, a force of a predetermined magnitude is generated against the piston to cause a contraction of the fluid cylinder at a predetermined rate, and when fluid at the same rate of flow and at the same predetermined pressure is communicated to the expansible chamber, a force of the same predetermined magnitude is generated between the second piston and the blind end of the connecting rod to cause an expansion of the fluid cylinder at the same predetermined rate as when the fluid cylinder is contracted. A directional control valve, disposed in the closed circuit between the inlet and outlet of the fluid pump, is adapted to selectively direct fluid to the rod side of the first piston within the fluid cylinder, while exhausting fluid from the expansible chamber and vice versa, so as to selectively expand and contract the fluid cylinder at the same rate. The rate of movement of expansion and contraction is controlled by the amount of fluid displaced by the fluid pump.

A second directional control valve is adapted to direct fluid from a second source of fluid to a pressure responsive displacement control mechanism to selectively vary the displacement of the fuid pump. The rate of fluid flow to the pressure responsive displacement control mechanism is selectively varied to control the rate of displacement of the fluid pump and to thereby selectively control the rate of expansion and contraction of the fluid cylinder. When the side of the first piston opposite the rod carrying side thereof is communicated to a fluid under pressure, an additional expansion force may be selectively provided.

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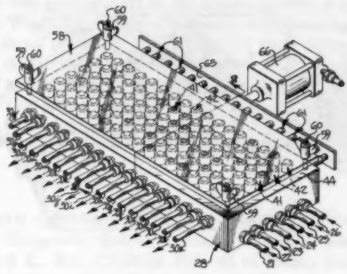
**3,744,376**
**PRESSURE FLUID CONTROL ARRANGEMENT AND METHOD**
**William T. Carpenter, Stanley, N.C., assignor to Synalloy Corporation, Spartanburg, S.C.**
**Filed Mar. 16, 1972, Ser. No. 235,314**
**Int. Cl. F15b *11/16*, *13/06***
**U.S. Cl. 91—414** **10 Claims**

A control arrangement and method wherein the interconnection of a plurality of pressure fluid actuated devices with a plurality of pressure fluid control devices is accomplished through a matrix block in such a manner as to facilitate assembly and modification of the control arrangement. Flow of pressure fluid through passageways formed in the matrix block



is controlled by the positioning of diode valves or plugs at the intersections of passageways in the matrix block and prompt reaction of the pressure fluid actuated devices is assured by coordination of application and relief of pressure thereto.

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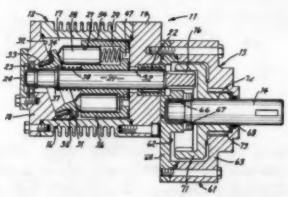
**3,744,377**
**HYDRAULIC MOTOR DRIVE**
**John A. Lauck, 307 Colfax Avenue, Benton Harbor, Mich.**
**Filed Apr. 12, 1971, Ser. No. 133,358**
**Int. Cl. F04b *9/00***
**U.S. Cl. 91—489** **12 Claims**



A hydraulic drive device having a hydraulic motor section fixedly connected to a gear reduction section. The hydraulic motor section includes movable pistons disposed within a rotatable cylinder barrel and maintained in engagement with an inclined swash or cam plate for causing rotation of the cylinder barrel. The cylinder barrel is rotatably connected to and drives a shaft, which shaft has a gear thereon disposed in meshing engagement with a further enlarged gear disposed within the gear reduction section. Suitable passages and grooves are provided in the cylinder barrel to permit leakage fluid within the pump section to be discharged into the reduction gear section. One-way check valve devices coact between the motor ports and the gear reduction section for enabling discharge of leakage fluid into the low pressure or discharge port.

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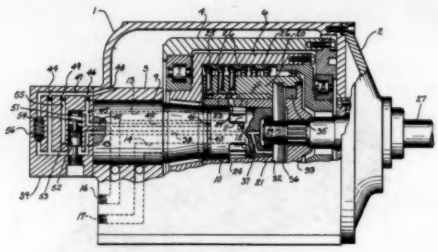
**3,744,378**
**PINTLE PUMP**
**James K. Douglas, Shorewood, Wis., assignor to The Oilgear Company, Milwaukee, Wis.**
**Filed May 30, 1972, Ser. No. 258,121**
**Int. Cl. F01b *13/06***
**U.S. Cl. 91—484** **5 Claims**

The invention comprises a radial piston hydraulic pump or motor having a control to position the cylinder barrel on a tapered pintle to maintain the necessary flow of leakage fluid in each direction outwardly between their bearing surfaces for different or varying operating conditions. The control includes a servomotor to urge the cylinder barrel on the taper of the

pintle in accordance with the flow of the leakage fluid discharged at one end of the pintle with such flow regulated so as to equal or exceed the flow of leakage fluid discharged at the other end of the pintle.



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**3,744,379**

## ROTARY HYDRAULIC MACHINES

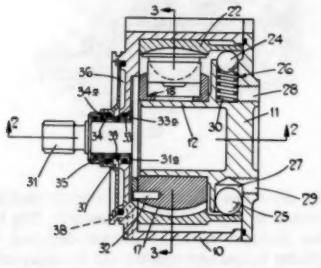
**Frank George Freeman, Solihull, Warwickshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Mar. 29, 1971, Ser. No. 128,861**

**Claims priority, application Great Britain, Apr. 3, 1970, 15,808/70**

**Int. Cl. F01b *13/06***

**U.S. Cl. 91—497** **11 Claims**



A hydraulic pump or motor in which a rotor has a plurality of pistons slidable in radial bores in the rotor. The pistons engage a cam ring surrounding the rotor, and the eccentricity of the cam ring can be varied by means of one or more servo pistons.

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**3,744,380**

## PISTON MACHINE HAVING RADIALLY DISPOSED PISTONS

**Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland**

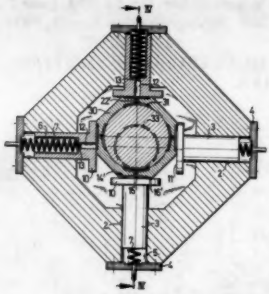
**Filed Sept. 27, 1971, Ser. No. 184,159**

**Claims priority, application Switzerland, Oct. 7, 1970, 14763/70**

**Int. Cl. F01b *1/02***

**U.S. Cl. 92—61** **9 Claims**

Hydrostatic bearings are provided between the pistons and block of a size to substantially balance the axial hydraulic forces on the pistons. Similar bearings are provided between the eccentric and block, and the shaft journals and housing. These hydrostatic bearings are sized and interconnected together to equalize the static forces between the shaft and block and between the shaft and housing. The various bearings can be interconnected by external pipes or by internal ducts in the shaft.



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**3,744,381**

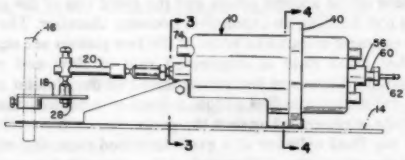
## PISTON ACTUATOR AND MOUNTING DEVICE THEREFOR

**Dalny Travaglio, Kensington, Calif., assignor to Universal Pneumatic Controls, Inc., Belmont, Calif.**

**Filed Sept. 1, 1971, Ser. No. 177,068**

**Int. Cl. F01b *29/00***

**U.S. Cl. 92—161** **5 Claims**



A piston actuator particularly adaptable for air conditioning systems and in combination therewith a mounting device that enables the actuator to be installed quickly without special tools or skilled labor. The mounting device is adaptable to be fixed to the outer wall of a duct at a particular preselected location with respect to a control shaft that is to be operated by the actuator. It includes portions for receiving and holding the actuator body and means for latching it firmly in its operating position.

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**3,744,382**

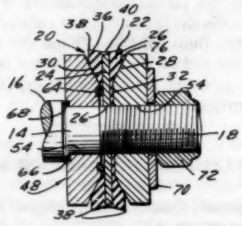
## PISTON STRUCTURE

**Alvin D. Williams, 2253 Durfee Avenue, El Monte, Calif.**

**Filed Aug. 5, 1971, Ser. No. 169,265**

**Int. Cl. F16j *1/00, 1/06***

**U.S. Cl. 92—206** **3 Claims**



A piston structure for hydraulic hoist cylinders for auto-transport equipment, the piston structure having sealing

means of resilient material, the sealing means including a sealing element with an annular part which has a peripheral part disposed on the periphery of a metal disc having an axial opening therethrough. The sealing element has an outer peripheral part with parallel side walls and has an annular, wide-angle, V-shaped peripheral groove therein, the free annular edges of which are relatively sharp and adapted to slidingly engage the inner wall of the cylinder in which the piston is operably disposed. From the inner ends of the parallel side walls there are sides which taper inwardly at an angle of 27½*L*to an apex.

There is an annular support member at each side of the disc and sealing member, and the sides of the support members facing the seal and disc are annularly beveled at the periphery of said support members, the bevel being at an angle of 27½*L*, and when the support members and sealing means are assembled the beveled parts of the support members engage the tapered sides of the sealing element and support said sealing element against longitudinal movement relative to the piston assembly.

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**3,744,383**

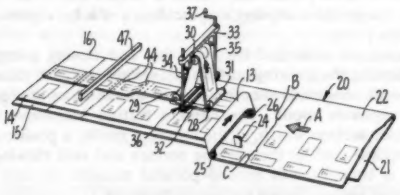
**BANDED PLASTIC BAG MANUFACTURING METHOD AND APPARATUS**

**Jerry L. Finch; Donald E. Misner, and James L. Brooks, all of Greenburg, Ind., assignors to Crown Zellerbach Corporation, San Francisco, Calif.**

**Filed Dec. 13, 1971, Ser. No. 207,373**

**Int. Cl. B31b *49/04, 1/90***

**U.S. Cl. 93—35 R** **6 Claims**



An apparatus and method for manufacturing banded plastic bags from a unitary web imprinted with bag faces and bands. The bands are separated from the remainder of the web, accurately positioned relative to the bag faces and secured thereto.

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**3,744,384**

**ROLLERS FOR CUTTING, CREASING, PERFORATING OR EMBOSSING SHEET MATERIALS**

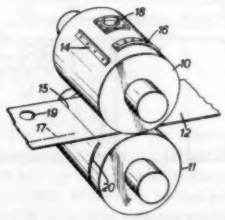
**Percival Ward Jarritt, and David Michael Jarrett, both of Bristol, England, assignors to Masson Scott Thrissell Engineering Limited, Bristol, England**

**Filed Feb. 11, 1971, Ser. No. 114,417**

**Claims priority, application Great Britain, Feb. 21, 1970, 8,450/70; Mar. 13, 1970, 12,067/70**

**Int. Cl. B31b *1/14***

**U.S. Cl. 93—58.2 R** **3 Claims**



A roller for cutting, creasing, perforating or embossing sheet materials, such as paper, cardboard or thin plastic, is provided with tools which are secured on the cylindrical roller surface instead of in recesses in the surface. Each tool comprises a thin metal sheet or strip formed to the curvature of the roller surface and having a raised cutting, creasing, perforating or embossing formation. The strip may be formed of a standard rule steel ground to the desired profile, e.g. with an inverted V-section cutting or creasing edge running longitudinally along this strip. A plurality of such strips may be secured around the roller surface at any desired angle to its axis and may be butted against one another at any convenient angle so that the cutting or creasing edges intersect in sharp corners. Complex shapes such as curves may be formed on flat sheets or plates of similar thickness and material to the strips.

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**3,744,385**

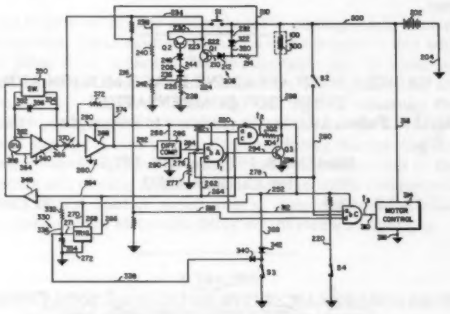
**CONTROL SYSTEM FOR PHOTOGRAPHIC APPARATUS**

**John P. Burgarella, Sudbury; Peter P. Carcia, Reading, and Richard C. Kee, Chestnut Hill, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 29, 1971, Ser. No. 213,317**

**Int. Cl. G03b *17/53, 19/12***

**U.S. Cl. 95—11 R** **34 Claims**



Photographic apparatus and a control system therefore which functions to carry out a series of operational events in response to the temporary, manual depression of a start switch. The control system incorporates an electronic latch which is activated only after select initial ones of these operational events are carried out. Additionally, the control system incorporates a feature preventing an unwanted repetition of photographic cycles as a consequence of inadvertant continued depression of the start switch before and beyond the termination of a given photographic cycle.

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**3,744,386**

**FILM ADVANCING APPARATUS**

**Lawrence M. Douglas, Eastondale, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

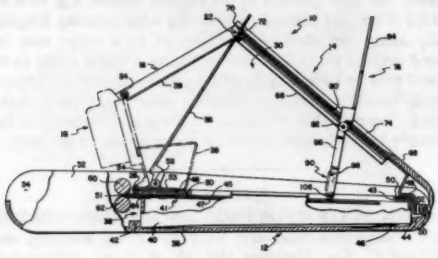
**Filed Oct. 4, 1971, Ser. No. 186,032**

**Int. Cl. G03b *19/02***

**U.S. Cl. 95—11 R** **12 Claims**

Photographic apparatus including first and second housing sections connected to each other to define sides of the apparatus. The first housing section includes a chamber for receiving a film cassette and a pair of rollers mounted adjacent one end of the chamber. The film cassette houses a plurality of film units, each of which includes superposed photosensitive and image-receiving elements and a container of processing liquid attached near leading ends of the elements. A lever having a film-engaging member at one end and a hand-engageable portion at the other end is pivotally connected to the second housing section in a manner which allows the film-engaging member to swing through an arc which carries it into the film cassette's exposure aperture to engage the forwardmost film unit therein and advance it into the bite of the rollers. The rollers are driven by a battery operated motor having an open

switch in the circuit between the two. The switch is maintained in an open position by a cam which is located in position to be engaged and rotated by the film unit as it moves from the cassette toward the rollers for allowing the switch to close, thereby initiating operation of the rollers. The rollers



are stopped due to movement of the film unit out of engagement with the cam while the trailing end of the film unit is still located in the bite of the rollers, thereby releasably retaining the film unit in the bite of the rollers until removed by the user.

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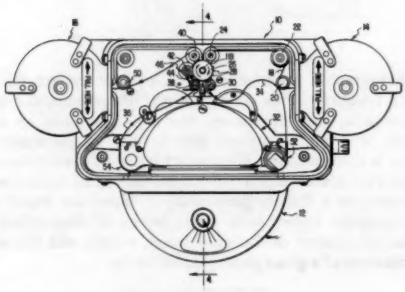
**3,744,387**

## CAMERA WITH APPARENT IMAGE MOTION AND DIRECTION COMPENSATION

**David L. Fuller, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.**

**Filed Oct. 8, 1971, Ser. No. 187,768**
**Int. Cl. G03b *37/02***
**U.S. Cl. 95—12.5** **21 Claims**



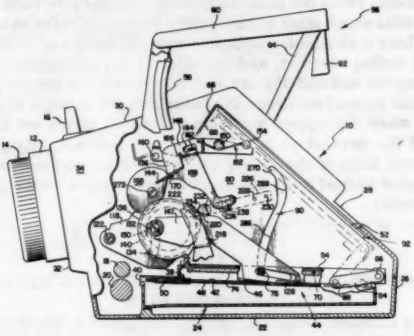
A camera which compensates for apparent image motion due to the velocity component of an aircraft which is parallel to the ground surface employs a reciprocating film gate for this purpose. The film gate describes simple harmonic motion back and forth along a path relative to the camera lens and parallel to the earth's surface such that the at midpoint of such movement, where the film gate velocity is maximum, the film is positioned at the focal plane of the lens and exposure is made. The time period of the harmonic motion is fixed and the stroke of such motion is variable so that the maximum velocity of the film gate is also selectively variable to match it with the apparent image motion. The direction of the motion path is also selectively variable with relation to the lens so that the path may be adjusted to be parallel with the earth's surface despite the attitude of the aircraft (i.e. whether in level flight or in ascending or in descending mode). Film is advanced step-by-step through the film gate, the advance being made on the return motion of the film gate and the film being captured and held during forward motion of the film gate when the exposure is made.

**3,744,388**

## FILM PROCESSING APPARATUS FOR USE WITH A PHOTOGRAPHIC CAMERA

**Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 20, 1971, Ser. No. 209,542**
**Int. Cl. G03b *17/52***
**U.S. Cl. 95—13** **20 Claims**



The present invention envisions a reflex camera having a specular surface within the optical path of the film plane. An operator mechanism positions a viewing surface closely proximate the film plane for focusing purposes and in a subsequent exposure mode positions a reflective surface within the optical path in a position causing a coincidence of a focal plane with the film plane.

Means are provided for receiving and storing energy for positioning the viewing surface proximate the film plane and for positioning said reflective surface within the optical path in said exposure mode. The camera further includes a fixed specular surface which, in the focusing mode, is positioned in the optical path to the viewing surface and said viewing surface is brought into spaced parallel relation to said fixed specular surface during the exposure mode.

The camera includes a support for locating a film-advancing apparatus for engaging and moving the film unit, subsequent to exposure, from its exposure position into the bite of a pair of processing rolls.

A novel mechanism transfers, to said film-advancing apparatus, a portion of the energy being supplied to said energy storage means to position said viewing surface.

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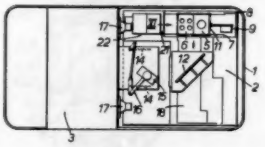
**3,744,389**

## AUTOMATIC COIN-OPERATED PHOTOGRAPHIC APPARATUS UTILIZING SELF-DEVELOPING FILM UNITS

**Charles William Clark, Kings Grove, Maidenhead, England**

**Filed Mar. 27, 1972, Ser. No. 238,096**
**Claims priority, application Great Britain, Mar. 29, 1971, 8,021/71**
**Int. Cl. G03b *17/50***
**U.S. Cl. 95—14** **18 Claims**



Automatic coin-operated photographic apparatus comprises a camera and a magazine for cassettes each comprising a number of self-developing film units, transfer means for

replacing an expended cassette at the camera by a cassette from the magazine, and means for extracting the film units one by one from the cassette at the camera. The finished film may be delivered to a slot for collection.

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**3,744,390**

## AUTOMATIC COIN-OPERATED PHOTOGRAPHIC APPARATUS UTILIZING SELF-DEVELOPING FILM UNITS

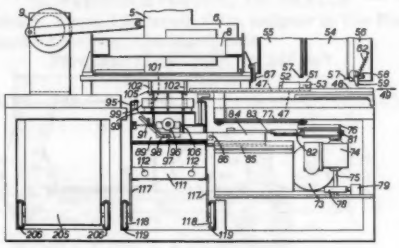
**Charles William Clark, Kings Grove, Maidenhead, Berkshire, England**

**Filed Mar. 27, 1972, Ser. No. 238,071**

**Claims priority, application Great Britain, Mar. 29, 1971, 8,023/71**

**Int. Cl. G03b *17/50***

**U.S. Cl. 95—14** **12 Claims**



Automatic coin-operated photographic apparatus for operation with cassettes each comprising a number of self-developing film units. The apparatus includes a camera, a magazine for the cassettes, and transfer means for replacing an expended cassette at the camera by a cassette from the magazine.

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**3,744,391**

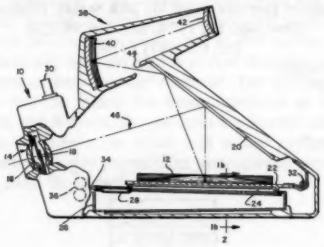
## CAMERA WITH A STIGMATIC FRESNEL OPTICAL ELEMENT

**William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 28, 1971, Ser. No. 213,021**

**Int. Cl. G03b *19/21***

**U.S. Cl. 95—42** **9 Claims**



The invention described herein provides a novel Fresnel mirror having a warp to correct astigmatism that might otherwise be introduced into an image by a Fresnel optical element. Fresnel optical elements according to the present invention are particularly useful in optical systems required to form off-axis images of entrance pupils and the like. SPecific applications include a viewfinder for a reflex camera and a spectrometer.

**3,744,392**

## FOCAL PLANE SHUTTER GAP SETTING MECHANISM

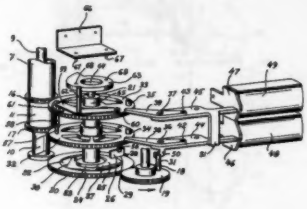
**Lennart Gunnar Oskar Dahlgren, Vastra Frolunda, and Alf Ingvar Alfredsson, Savedalen, both of Sweden, assignors to Fritz Victor Hasselblad, Goteborg, Sweden**

**Filed Dec. 8, 1970, Ser. No. 96,080**

**Claims priority, application Sweden, May 6, 1970, 6235/70**

**Int. Cl. G03b *9/34***

**U.S. Cl. 95—57** **13 Claims**



An improved shutter assembly for a photographic camera with a focal plane shutter, such as a curtain-type or one with two plane disks separated by an adjustable gap, in which an opening means and a closing means are separated by an adjustable gap, means for cocking, locking and releasing the shutter are operatively connected with means for forming a preset gap and means for opening and closing the opening and closing means, respectively, are operatively connected to the opening and closing means. The preset gap width corresponds to the fastest shutter speed and at slower speeds an electromechanical or electronic delay means forms a larger gap.

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**3,744,393**

## PRESET STOP DEVICE FOR INTERCHANGEABLE LENS FOR SINGLE LENS REFLEX CAMERA

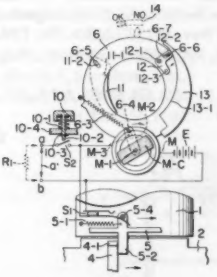
**Takashi Uchiyama, Yokohama, and Tetsuya Taguchi, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 20, 1971, Ser. No. 209,544**

**Claims priority, application Japan, Dec. 28, 1970, 45/123917**

**Int. Cl. G03b *9/07*, *17/14***

**U.S. Cl. 95—64 B** **10 Claims**

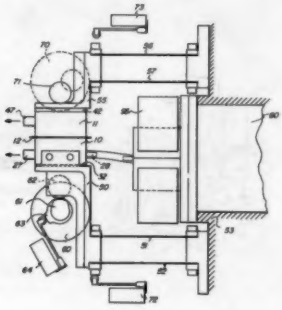


A preset stop or aperture device in an interchangeable lens for a single-lens reflex camera comprises an aperture ring for stopping down aperture blades to a position determined by a preset ring. The aperture ring is driven by an electromagnetic drive means connected with a power supply circuit including a switch actuated by the aperture driving member of the camera.

**3,744,394**
**APPARATUS FOR RAPID PROCESSING PHOTOGRAPHIC FILM**

Ronald R. Firth, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1972, Ser. No. 237,302
Int. Cl. G03d *13/00*
U.S. Cl. 95—89 R 4 Claims

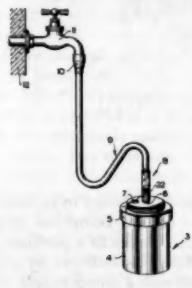


A latent image on a sheet or strip of film is rapidly processed to produce a dry, developed film by positioning it between a pair of spaced platens. The one platen is moved into contact with the film and then the other platen is moved into position so as to clamp the film therebetween. The other platen is also provided with a resilient frame member which provides a seal with respect to the support side of the film. A recess in the one platen is interconnected to the processing solutions through a metering valve so that each solution is moved into the recess in a required order so as to develop the latent image area. The flow of solution is maintained at a generally consistent and uniform temperature from the point of introduction into the recess to the point at which it is withdrawn after processing has been completed. A suction applied to a configuration of passages in the other platen draws the film toward the facing surfaces so as to maintain it in a speced and generally parallel relation to the recess in the one platen. The uniform space so provided permits the flow of solution to be moved across and in contact with the emulsion surface of the film.

**3,744,395**
**RECEPTACLE FOR TREATING PHOTOGRAPHIC MATERIALS**

Helmut Berchtold, Gummersbach, Germany, assignor to Firma Johannes Bockemuhl, Kupplungsstuck, Germany

Filed Nov. 15, 1971, Ser. No. 198,522
Claims priority, application Germany, Aug. 21, 1971, P 21 41 981.8
Int. Cl. G03d *1/14*
U.S. Cl. 95—90.5 14 Claims

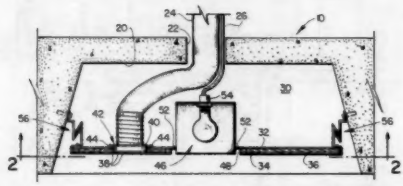


A tank for processing photographic materials has an opening which is closed with a movable cover provided with an inlet and outlet for water. A hose is connectable with a source of water and a releasable connecting element connects the hose with the inlet in the cover. The connecting element has a flow passage for the water and is at least in part transparent so that the interior of the passage can be observed. Also, the connecting element has a port which communicates with the flow passage and which can be partly or completely closed at the will of the user.

**3,744,396**
**COMPOSITE AIR DISTRIBUTING, LIGHTING AND ACOUSTICAL UNIT**

George K. Raider, Lombard, Ill., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Apr. 14, 1972, Ser. No. 244,092
Int. Cl. F24f *7/00*
U.S. Cl. 98—40 DL 10 Claims

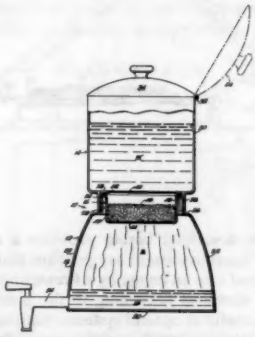


A composite air distributing, lighting and acoustical ceiling unit for use in coffer-type ceilings and comprising a panel with a solid upper plate, a perforate lower plate and sound absorbing acoustical material therebetween. An air distributing device is supported in a suitable opening in the panel and discharges downwardly through the perforate lower plate. An incandescent lighting fixture is also supported by the panel and emits light through a central opening therein. Quick disconnect provisions for the air and electrical supply combine with detachable connecting devices to facilitate panel installation and removal. The latter comprises spring-metal arms with V-shaped end portions interengageable in connected relationship on upward movement of the assembled panel, air distributing device and lighting fixture. The panel connected arms are sprung inwardly with access about the panel edges for disengagement of the connecting devices and downward panel removal.

**3,744,397**
**APPARATUS FOR PRODUCING A BEVERAGE**

Juan Hernandez Herrera, 1240 W. 24th Street, Hialeah, Fla.

Filed Dec. 17, 1970, Ser. No. 99,138
Int. Cl. A47j *31/00*
U.S. Cl. 99—293 4 Claims



Apparatus and a method for producing a beverage in which a lower utensil includes a dispensing spout and will initially

contain a relatively small quantity of steam injected into it, or preparation water to be boiled or steamed through an overlying foraminous compartment element containing a measured quantity of a beverage-producing ingredient such as coffee, tea etc., the steam passing through a second foraminous bottomed container including a substantially greater quantity of preparation water; and the method consisting of injecting the steam into the lower utensil or boiling the preparation water in the lower utensil to create steam, and steaming it through the beverage-producing ingredient until the water in the upper container boils, and, thereafter, removing heat from the lower utensil resulting in the boiled water being sucked through the beverage-producing ingredient back into the utensil by means of which a beverage infusion is prepared.

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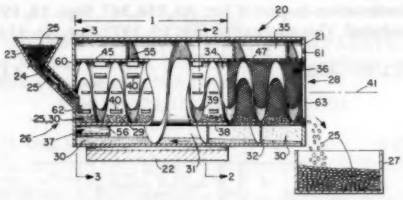
**3,744,398**

## CONTINUOUS PUFFING APPARATUS

**Alexander L. Liepa, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed May 1, 1972, Ser. No. 248,847**
**Int. Cl. A23i *1/18***
**U.S. Cl. 99—323.4** **19 Claims**



A continuous puffing apparatus for puffing bits of products such as ready-to-eat breakfast cereals, meat analogs, and the like. The apparatus includes means for passing a stream of such product bits therethrough, means for internally circulating a stream of heated particles of solid heat transfer material such as salt granules around a closed, internal path so that the two streams are mingled for only one portion of the total length of the closed, internal path of the heat transfer material, and means for heating the stream of heat transfer material particles as they traverse a second portion of the closed path of travel to maintain them at a substantially uniform predetermined temperature. Thus, the stream of product bits are substantially precluded from direct exposure to the means for heating the stream of heat transfer material particles. In this manner, the product bits are heated so that puffing can be effected essentially only during the period they are mingled with the particles of heat transfer material. The puffing apparatus may also include means for being operated at an elevated pressure in which event, the particles are heated within the apparatus to a temperature which will induce puffing when the bits are subsequently exposed to atmospheric pressure upon emerging from the apparatus.

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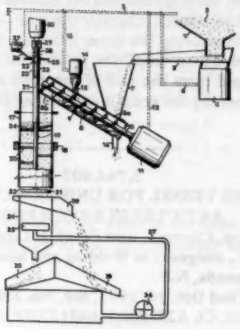
**3,744,399**

## PROCESS AND APPARATUS FOR REMOVING THE OUTER LAYER FROM CEREAL GRAINS BY A WET METHOD

**Robert C. Bontell, Clichy Hauts-de-Seine, France, assignor to Societe D'Etude et D'Exploitation de Procedes pour L'Industrie Alimentaire SEPIAL, Clichy (Hauts-de-Seine), France**

**Filed Oct. 29, 1970, Ser. No. 84,997**
**Claims priority, application France, Nov. 24, 1969, 6940325**
**Int. Cl. B02c *17/00***
**U.S. Cl. 99—233.6** **6 Claims**

A process and apparatus for removing the outer covering from cereal grains by a wet method consisting of subjecting the grains to moisture and to mechanical agitation for mixing the grains and causing them to rub against each other under pressure. The pressure is maintained substantially constant and is uniformly distributed within the mass of the treated



grains and in the presence of water equal to between 5 and 15 percent of the dry weight of the grains. The water adheres to the grains by capillary action and penetrates their covers in the course of treatment.

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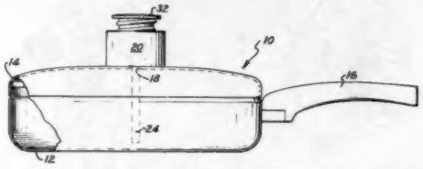
**3,744,400**

## ATTACHMENT FOR TENDERIZING MEAT

**Oscar G. Woodruff, 404 N. Oro St., Stockton, Calif.**

**Filed Oct. 27, 1971, Ser. No. 192,886**
**Int. Cl. A47j *37/10***
**U.S. Cl. 99—345** **5 Claims**



A meat tenderizer attachment that is secured to the lid of a frying pan. The attachment incorporates a bolt that extends through a hole in the lid and that secures a tank to the top of the lid and a hollow stem to the bottom of the lid. A bore extending through the bolt enables liquid in the tank to flow from the tank through the bolt and the stem towards the pan.

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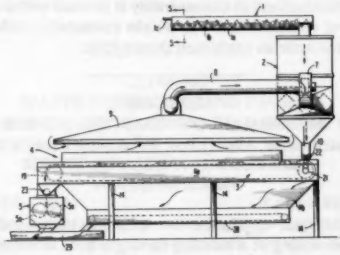
**3,744,401**

## GRAIN TREATING AND COOKING APPARATUS

**Garlan R. Polan, Route 5, Hereford, Tex.**

**Filed Dec. 27, 1971, Ser. No. 212,398**
**Int. Cl. A23k *1/00***
**U.S. Cl. 99—352** **10 Claims**



Grain is fed to an auger conveyor where, depending upon the moisture of the grain being treated, water or a chemical

solution is sprayed onto the grain to increase the moisture constant thereof. The moistened grain is discharged into a hopper having a controlled discharge end spaced above one end of an endless conveyor which is adapted to travel through a heat source. A predetermined layer of moistened grain is deposited from the hopper onto the endless conveyor and carried into the heat source whereby the grain is quick-cooked or heated thereby causing the inner moisture of the grain to expand and explode or "pop" the grain. The "popped" grain is then discharged from the end of the endless conveyor into a roller mill, whereby the grain is crushed and then packaged for future use.

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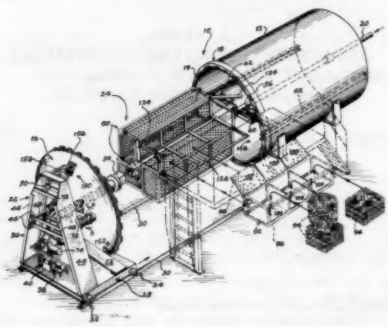
**3,744,402**

## PRESSURE VESSEL FOR UNIFORMLY TREATING ARTICLES IN BATCH FORM

**Henry J. Piegza, Clarence, and Frank J. Leofsky, East Aurora, both of N.Y., assignors to Welding and Steel Fabrication Co., Inc., Tonawanda, N.Y.**

**Filed Dec. 16, 1971, Ser. No. 208,553**
**Int. Cl. A23l** *3/16*; **A47j** *27/16, 36/20*
**U.S. Cl. 99—360** **13 Claims**



A plurality of perforated, article containing baskets are removably fixed for rotation with a treating fluid distributing shaft assembly, which is removably insertable axially through an end access opening of a horizontally disposed pressure vessel in telescopic relationship with a treating fluid supply conduit extending through an opposite closed end of the vessel. The outer end of the shaft assembly and a door for closing the access opening are supported by a track mounted trolley, whereby the shaft assembly is withdrawn from the vessel or inserted thereinto as the door is moved into open or closed positions thereof. Streams of treating fluid are directed radially through the baskets as the assembly is rotated within a treating fluid filled vessel, thereby to obtain essentially uniform treatment of the articles contained therewithin.

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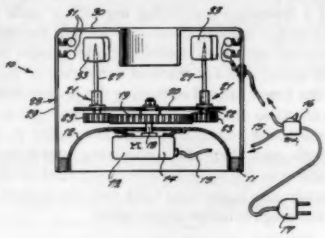
**3,744,403**

## MARSHMALLOW TOASTING DEVICE

**John Castronuovo, Albany Post Road, New York, N.Y.**

**Filed Oct. 24, 1972, Ser. No. 299,828**
**Int. Cl. A47j** *37/04*
**U.S. Cl. 99—421 V** **1 Claim**

An electrical appliance for toasting marshmallows, the device consisting of a housing having a base in which an electric motor driven by house current drives a gear train so to rotate a horizontal turntable that travels under a canopy that serves as an oven where electric heating elements are located, and the turntable supporting upright picks on each of which a marshmallow is impaled, each pick slowly rotating as the



turntable turns, so that all sides of the marshmallow are faced to the oven heating elements during toe toasting operation.

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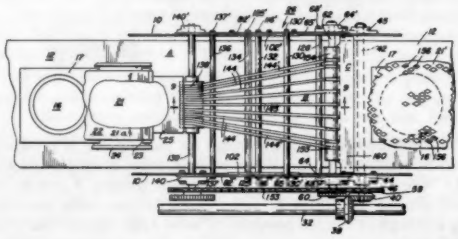
**3,744,404**

## LATTICE PIE-TOPPING APPARATUS

**David C. Eisendrath, Evanston, and Peter Klykun, Skokie, both of Ill., assignors to Colborne Manufacturing Company, Chicago, Ill.**

**Continuation-in-part of Ser. No. 858,367, Sept. 16, 1969, abandoned. This application Feb. 10, 1971, Ser. No. 114,137**
**Int. Cl. A21c** *11/12*
**U.S. Cl. 99—450.1** **5 Claims**



A plurality of coplanar diverging belts is provided to receive and gradually expand laterally, individual longitudinally slitted dough-sheets into a lattice form of topping for pies and the like. The diverging belts operate in cooperation with co-rotating slitting knives and guide plates to form and deposit the individual lattice toppings in sequence upon a continuous series of untopped pies carried by a continuously moving conveyor. In a modified form of the apparatus, dough-sheets are slitted transversely and delivered to a more rapidly moving means so as to expand the dough-sheets longitudinally and thereby open the slits and form the lattice topping.

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**3,744,405**

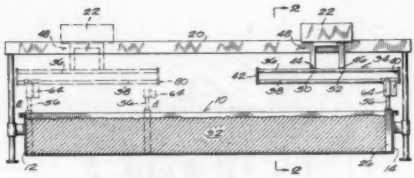
## SUPPORT FOR KNIFE ASSEMBLY IN CHEESE PROCESSING EQUIPMENT

**Fred A. Loichinger, Manitowoc, Wis., assignor to Stoelting Brothers Company, Kiel, Wis.**

**Filed May 24, 1972, Ser. No. 256,326**
**Int. Cl. A01j** *25/02*
**U.S. Cl. 31—48** **8 Claims**

A carriage is mounted for movement between opposite ends of a cheese processing vat. A knife assembly is suspended from the carriage and the support for the knife assembly includes an elongated, circular in cross section member extending parallel to the direction of travel of the carriage and connection of the knife assembly to that elongated member is made through a bracket assembly having a tubular sleeve surrounding and slideable on that member. The connection between the knife and the bracket assemblies is such that as

the carriage moves relative to the vat, tending to move the knife assembly through a medium in the vat, a force is generated which binds the tubular sleeve of the bracket assembly on the elongated support member thereby locking the bracket assembly on the support so that the knife assembly is



carried through the vat by the carriage. The binding engagement with the support can be selectively released to permit relative movement of the support and the knife assembly to properly position the knife assembly for complete travel up to the opposite longitudinal ends of the vat.

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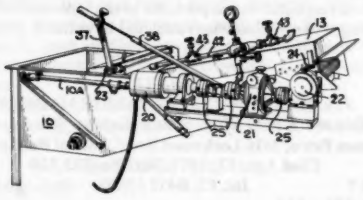
**3,744,406**

## SHRIMP FEEDING AND COOKING APPARATUS

**James Martial Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.**

**Filed Feb. 28, 1972, Ser. No. 229,632**
**Int. Cl. A47j *27/04***
**U.S. Cl. 99—516** **9 Claims**



The present disclosure is directed to a shrimp feeding and cooking apparatus in which the feed tank has a frame assembly pivotally mounted at an upper discharge end and which frame is positioned to support at an inclination an endless conveyor, a feed paddle over the conveyor and a cooker over the conveyor upstream of the feed paddle. The frame assembly and the elements carried thereby are swingable about the pivot to remove everything clear of the feed tank.

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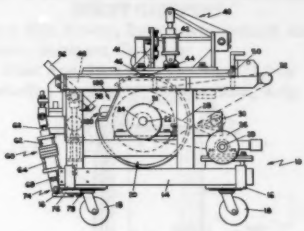
**3,744,407**

## UNIVERSAL SINGLE SIDE SKINNING MACHINE

**Martin L. Harlan, and Paul V. Kalavitz, both of Grand Rapids, Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.**

**Filed Aug. 26, 1971, Ser. No. 175,268**
**Int. Cl. A22c *17/12***
**U.S. Cl. 99—589** **8 Claims**

A universally positionable skinning machine for separating the skin and residual meat of single hog sides. The skinning machine is uniquely adapted for placement on either side of a conveyor on which the hog sides are transported along a processing line. The apparatus includes a cam-controlled, adjustable, double-acting, fluid-cylinder control apparatus to position the skinning blade in a first, raised, non-cutting position, or a second cutting position, and in the event of excessive pressure against the blade, to allow the blade to move temporarily away from the skin for relief of the excess pressure. The apparatus further includes a unique gripping jaw having a specially configured locking lip arrangement to hold a



minimal edge of the hog side while at the same time preventing it from pulling out of the clamp during skinning operations.

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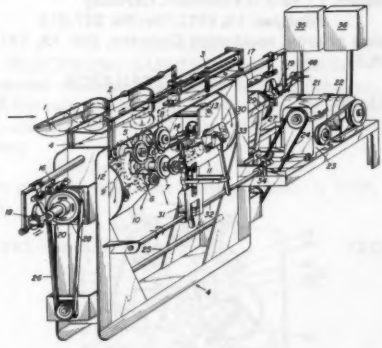
**3,744,408**

## COCONUT PARING MACHINE

**Julian O. Palis, San Pablo City, Philippines, assignor to General Foods Corporation, White Plains, N.Y.**

**Filed June 9, 1971, Ser. No. 151,408**
**Int. Cl. A23n *7/00***
**U.S. Cl. 99—595** **10 Claims**



A paring machine designed to impart dual rotation to an object to be pared whereby the object is rotated simultaneously about two perpendicular axes of rotation at different speeds and contacted with a cutting device. The machine consists of four principal assemblies: 1) feeding and positioning device; 2) assembly adapted to receive, grip, rotate and eject the object to be pared; 3) stationary cutter assembly for removing the skin of the object as the object rotates; 4) programming and pneumatic control means for actuating the assemblies in the proper step sequence and time durations.

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**3,744,409**

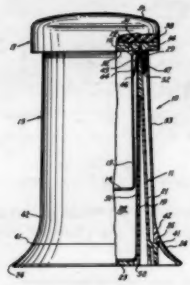
## WASTE CONTAINER AND PACKER

**Roy R. Bradbury, II, St. Louis, Mo., assignor to Popeil Brothers, Inc., Chicago, Ill.**

**Filed Mar. 6, 1972, Ser. No. 232,045**
**Int. Cl. B30b *1/00***
**U.S. Cl. 100—102** **8 Claims**

The waste container and packer includes an open top cylindrical receptacle, a plunger reciprocally movable within the receptacle, and a seat on the upper end of the plunger. A snap ring on the rim of the receptacle guides the plunger in its reciprocal movement. A disposable liner for the receptacle

has the upper end thereof folded over the rim and secured to the receptacle when the snap ring is mounted in place. Waste



in the liner is packed or compressed by the weight of a person supported on the seat.

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**3,744,410**

**TYPE SETTING DEVICE FOR POSTAGE METERS**

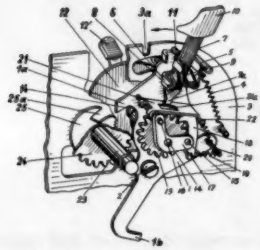
**Wilhelm Muller, Kurzroderstr. 8, and Friedrich Heil, Kreuzstr. 53, both of Frankfurt, Germany**

**Filed Jan. 13, 1972, Ser. No. 217,454**

**Claims priority, application Germany, Jan. 15, 1971, P 21 01 708.3**

**Int. Cl. B41j** *7/02*; **B41l** *47/58*

**U.S. Cl. 101—91** **3 Claims**



A one-finger postage amount setting device in a postage meter includes setting means, switching means and a pivotable clutch lever supporting the setting means. The clutch lever is pivotable between a first position in which the setting means and the switching means are in operative engagement, and a second position in which the setting means and the switching means are operatively disengaged. A locking lever is pivotally mounted on the clutch lever, and fixed locking means are engageable by the locking lever for maintaining the clutch lever in the first position thereof. First spring means bias the clutch lever in a direction from the first position to the second position thereof, and second spring means bias the locking lever into resilient engagement with the fixed locking means in the first position of the clutch lever. The setting means includes a drive gear, pawl means cooperatively engaging the drive gear, and a locking plate pivotally mounted on the clutch lever. The locking lever has a projection for locking the locking plate against the pawl in the second position of the clutch lever, and is movable for unlocking the locking plate from the pawl in the first position of the clutch lever.

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**3,744,411**

**PRINTING OR STAMPING DEVICE WITH TYPE BELTS**

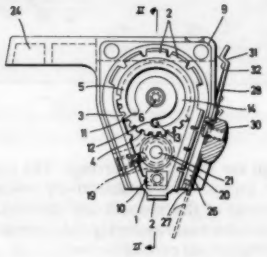
**Werner Becker, Hauptstr. 25, Hirschhorn/Neckar, Germany**

**Filed June 10, 1970, Ser. No. 44,069**

**Claims priority, application Germany, June 10, 1969, P 19 29 307.3**

**Int. Cl. B41j** *1/20*

**U.S. Cl. 101—111** **7 Claims**



An improved stamping or printing device comprising flexible belts with type characters on their outer surfaces. The belts are also provided with projections on their inner surfaces adapted to be driven by setting wheels. The belts run over an abutment for manual pressing of selected type characters on to a sheet of paper or the like. In order to avoid having the inwardly extending projections riding over the abutment and interfering with free belt movement, the projections are arranged on restricted lineal portions of the belts and rotation of the setting wheels is likewise restricted by suitable stop means.

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**3,744,412**

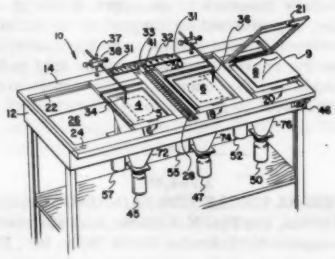
**STENCIL TYPE CHALK FABRIC MARKER**

**John Edward Grue, 7306 Prince George Road, and Karl Carmen Petro, 3616 Lockwood Road, both of Baltimore, Md.**

**Filed Apr. 13, 1971, Ser. No. 133,510**

**Int. Cl. B41f** *15/20*

**U.S. Cl. 101—114** **1 Claim**



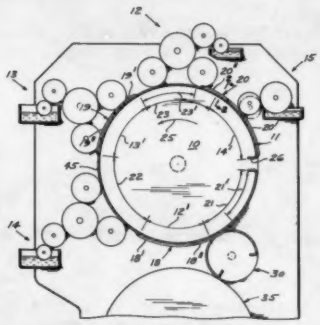
Marking apparatus characterized by at least two similar, scale inter related relatively movable marking units having horizontally co-planar frames holding perforated patterns for upward projection of powdered chalk through the performation onto workpieces; the top frames are supported by collection chutes terminated below by vessels for collecting excess chalk powder; a co-acting compressed-air system for supplying chalk-powder from vessels terminates in upwardly directed nozzles beneath the perforated patterns; the chalk supply vessels and the chalk recovery vessels are interchangeable, Novel pattern structure is also disclosed.

3,744,413

## INKING AND DAMPENING APPARATUS FOR PRINTING PRESS

Edwin K. Wolff, Stockholm, N.J., assignor to NJM, Inc., Hoboken, N.J.

Filed Apr. 12, 1971, Ser. No. 133,273
Int. Cl. B41f 7/08; B41l 25/16
U.S. Cl. 101—142 7 Claims



The cam controlling the application of the dampener to the dampening area of a printing plate mounted on the plate cylinder of a printing machine is constructed to adjust the amount of dampener needed to print the image in the printing area of any given printing plate.

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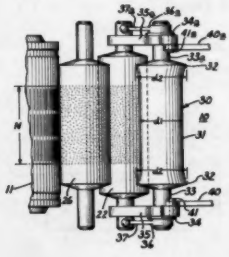
3,744,414

## DAMPENING DEVICE FOR LITHOGRAPHIC PRESSES

Karl Heinz Krochert, Offenbach, and Karl Zimmermann, Darmstadt, both of Germany, assignors to Roland Offsetmaschineenfabrik Faber & Schleicher AG, Offenbach/Main, Germany

Filed Oct. 19, 1971, Ser. No. 190,491
Claims priority, application Germany, Nov. 6, 1970, P 20 54 678.5
Int. Cl. B41f 7/26, 7/40
U.S. Cl. 101—148 7 Claims



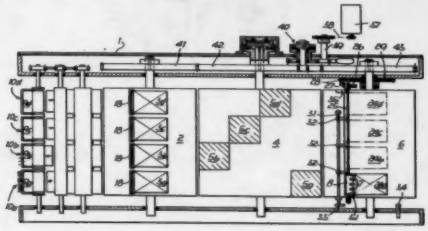
A dampening system for a printing press which includes a resilient metering roller which is concave in plan profile, having a diameter at its ends which is larger than the diameter over the central portion so as to develop relatively higher contact pressure at its ends for blocking off flow of dampening fluid in the end regions when printing a sheet of small size. Means are provided for skewing the metering roller to selectively reduce the pressure at the ends for securing a more nearly uniform axial distribution for the printing of sheets of full roller width. The skewing may be augmented to compensate for any bowing which may occur in the rollers. The skewing is effected by mounting the metering roller on individually swingable arms with means for differential adjustment of the arms. Eccentrics at the ends of the metering roller enable adjustment of the pressure.

3,744,415

## MULTICOLOR PRESS AND PROCESS WITH IMPRESSION CYLINDER HAVING AXIALLY SHIFTABLE SHEET GRIPPERS

Max Junghans Ras, Kloten, Zurich, Switzerland, assignor to J. G. Mailander, Stuttgart, Germany

Filed Aug. 16, 1971, Ser. No. 171,918
Claims priority, application Switzerland, Aug. 17, 1970, 12297/70
Int. Cl. B41f 5/02, 21/04
U.S. Cl. 101—177 8 Claims



A multicolor sheet offset printing process and a printing press in which a sheet is clamped upon an impression cylinder and printed with one color and then shifted on the same cylinder in the axial direction thereof to one or more further printing stations in each of which it is printed with another color.

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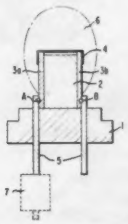
3,744,416

## ELECTRONIC SAFETY BRIDGE PRIMER

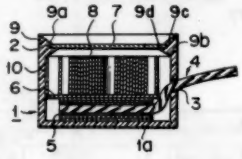
Hans-Heinrich Rudolph, Egersdorf, near Cadolzgurg; Uwe Brede, Schwaig, and Hellmut Bendler, Nurnberg, all of Germany, assignors to Dynamit Nobel AG, Postfach, Troisdorf, Germany

Filed Jan. 29, 1970, Ser. No. 6,783
Claims priority, application Germany, Mar. 3, 1969, P 19 10 665.1
Int. Cl. F42b 3/18
U.S. Cl. 102—28 M 12 Claims



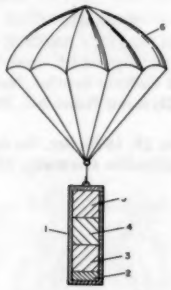
A detonator element of the bridge-type adapted for electrical ignition having two electrodes supported in mutually spaced relationship by an electrically non-conductive support member, a bridging conductor connected across the ends of the electrodes and capable of incandescence or explosive evaporation, and an ignitible charge in contact with the bridging conductor, and further including a mechanically solid semiconductor exhibiting a resistance which is variable depending upon the voltage applied thereto, the semi-conductor being disposed electrically in series with one of said electrodes and/or in parallel with the electrodes, the semiconductor additionally or alternatively serving as the means for connecting the bridging conductor across the ends of the electrodes.

3,744,417
CRACKER
Nobusato Kaneko, Uwajima, Japan, assignor to Kaneko Company, Uwojima-shi, Ehime-ken, Japan
Filed Nov. 4, 1971, Ser. No. 195,643
Claims priority, application Japan, Feb. 24, 1971, 46/10879; May 29, 1971, 46/44615; May 21, 1971, 46/44616
Int. Cl. A63h 35/00
U.S. Cl. 102—31 4 Claims



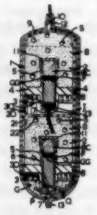

A cracker comprising a case, at least one reel of colored tape housed therein, an explosive disposed in the case and a fuse connected with the explosive, wherein there is shot up tape into the sky for display upon ignition of the explosive.

3,744,418
FLARES
Jesse F. Tyroler, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed June 3, 1971, Ser. No. 149,489
Int. Cl. F42b 13/38
U.S. Cl. 102—35.4 1 Claim



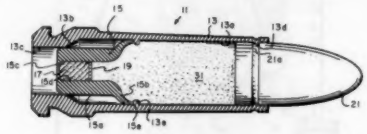
A flare is produced which by incremental configuration provides a more or less constant level of illumination on the ground.

3,744,419
PYROTECHNIC DEVICE
Hugh T. Hand, Mississauga, Ontario, Canada, assignor to Hand Chemical Industries Limited, Milton, Ontario, Canada
Filed June 17, 1970, Ser. No. 46,992
Claims priority, application Canada, Apr. 9, 1970, 079,654
Int. Cl. C06d 1/04, 1/10
U.S. Cl. 102—37.7 7 Claims



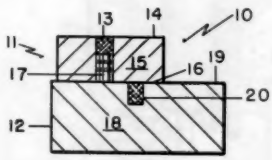
Air-burst pyrotechnic shells and an improved unitary casing for containing the pyrotechnic composition, the casing having a fuze-holder provided with an irregular internal surface capable of holding the fuze firmly in position. If desired, the casing can be provided with a shock-absorber to withstand the force imposed by a heavy propellent charge.

3,744,420
PISTON PRIMER CARTRIDGE WITH IMPROVED ONE PIECE PRIMER
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Continuation of Ser. No. 849,649, Aug. 13, 1969, abandoned.
This application Oct. 29, 1971, Ser. No. 193,921
Int. Cl. F42b 5/02
U.S. Cl. 102—38 13 Claims



An improved cartridge having a movable single-unit piston primer and an associated firing pin arrangement is disclosed for use in automatic and semi-automatic firearms which operate on the principle of primer set-back. The movable single-unit piston primer is cup-shaped and open toward the propellant-containing interior of the cartridge casing and contains a primer mixture but is devoid of a conventional anvil. The movable piston primer has a unitary integral cup having a tubular side wall and a relatively thinner and more deformable integral web-like closed base wall at the rearward end and with an annular flared flange portion formed at the forward open end which is adapted to obturate upon ignition of the propellant to provide a sliding gas seal and limit the rearward longitudinal movement of the primer by engaging an annular shoulder formed in the cartridge casing.

3,744,421
EXPLOSIVE SAFE AND ARMING SYSTEM
Donald E. Seeger, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Aug. 9, 1971, Ser. No. 170,170
Int. Cl. F42c
U.S. Cl. 102—70 R 5 Claims




An explosive safe and arming system for a munition wherein the explosive forms the container. The system includes a first portion having a primer and relatively sensitive charge imbedded within an insensitive explosive charge. The other portion includes a base charge of an insensitive explosive having disposed therein an intermediately sensitive explosive. The two portions are in abutting relation so that in one position the primer is outwardly exposed and the relatively sensitive charge is in-line with base charge. Under these conditions when the primer is ignited its burning will detonate the moderately sensitive charge that in turn will, by its explosive propagation, detonate the intermediate charge thereby creating sufficient energy to initiate the main high explosive container. In the other position the moderately sensitive explosive is out-of-line and can not detonate the insensitive and main charges. Thus, there is provided a safe and arming system

which is controlled by the positioning of two separate portions constituting the entire explosive munition.

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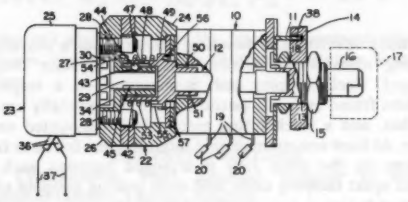
### 3,744,422
### RESETTABLE SWITCH MECHANISM

**Roy A. Zangrando, Clifton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed June 28, 1971, Ser. No. 157,519**
**Int. Cl. F42b** *5/08, 9/08, 21/38*
**U.S. Cl. 102—70.2 R** **6 Claims**



A small, low-power, remotely operated, manually reset, switch mechanism, which may be used for explosive munitions and like ordnance items consists of a motor, a rotary switch, a coupling unit and a rotary reset shaft located in coaxial relation, the motor and the switch being connected by the coupling unit which is the control element of the mechanism. The coupling unit includes a rotary sleeve connected with the switch shaft and concentric with the motor shaft. The shaft and sleeve may be spring biased to rotate in opposite directions. A detent ball, radially movable in a fixed retainer, which is concentric with and between the shaft sleeve, locks into a groove in the sleeve to hold the switch ON against the spring bias (thereby arming the device) and falls out into a groove in the motor shaft (thereby disarming the device) when the motor shaft is turned responsive to a remote control current applied to the motor.

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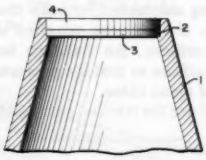
### 3,744,423
### GASEOUS OPTICAL FILTER

**Edwin P. Ertsgaard, Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Dec. 27, 1961, Ser. No. 162,609**
**Int. Cl. F42b** *5/08*
**U.S. Cl. 102—70.2 P** **10 Claims**



1. An optical filter for discrimination purposes in the infrared region comprising a casing containing an infrared absorbing gas which is effective to produce an extremely sharp absorption cut-off point when infrared radiation having wavelengths within a predetermined range is applied thereto thereby is effective to pass infrared radiation of wavelengths outside of said range, said casing having a circular configuration for close fitting engagement with a complementary aperture within the nose of a proximity fuze.

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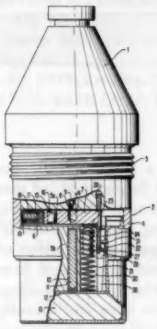
### 3,744,424
### DEVICE FOR PROVIDING AN INDICATION OF THE DISTANCE TRAVELLED BY AN OBJECT UNDER CONDITIONS OF ACCELERATION

**Jakhin Boaz Popper, Kiryat Motzkin, and Raphael Cohen, Haifa, both of Israel, assignors to The State of Israel, Ministry of Defense, Hakirya Tel Aviv, Israel**

**Filed Aug. 5, 1970, Ser. No. 61,059**
**Int. Cl. F42c** *15/24*
**U.S. Cl. 102—78** **8 Claims**



A device for providing an indication of the distance travelled by an object under conditions of acceleration comprising an elongated plate-like member which is longitudinally displaceable, under set back forces, in a direction opposite to that of said acceleration and with respect to a frame-like member fixed with respect to the object, spring biasing means for resisting the longitudinal displacement of said plate-like member and an abutment system associated with said members such that longitudinal displacement of the plate-like member is accompanied by a reciprocating, transverse displacement of the plate-like member.

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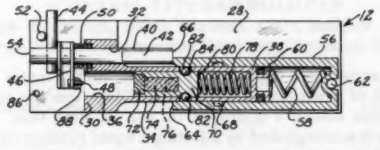
### 3,744,425
### EXPLOSIVE-DISSEMINATOR PACKAGE

**Richard C. Grimm, Triangle, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.**

**Filed Oct. 29, 1971, Ser. No. 193,785**
**Int. Cl. F42c** *9/02*
**U.S. Cl. 102—85** **11 Claims**



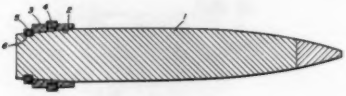
A package for the explosive-dissemination of material, e.g., chaff, is described herein as an embodiment of the invention. This package includes a safe-and-arm mechanism which prevents detonation of the explosive during transport and loading, and in the event of malfunction during the dispensing of the package. During normal operation, the fuze assembly must be unlocked and transferred to a first position for the initiation of the primer and pyrotechnic delay. Once the package clears the package dispenser, the fuze assembly is moved to a second position where the pyrotechnical delay becomes aligned with the detonator for the explosive.

3,744,426

## ROTARY SABOT PROJECTILE

Rex B. Butler, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 17, 1972, Ser. No. 244,848
Int. Cl. F42b *31/00*
U.S. Cl. 102—94 10 Claims



A sabot having a thermoplastic body and thermosetting reinforced phenolic ring embedded therein which ring retains a projectile in position in the forcing cone of a gun barrel is disclosed. A split ring plastic retainer is used to hold the sabot in place on the tapered rear portion of the projectile. When the projectile is fired, centrifugal force and heat cause the thermoplastic material to expand engaging both the rifling and side walls of the gun bore and thereby imparting a spinning motion to the projectile, while also acting as an obturator to prevent the escape of propellant gases.

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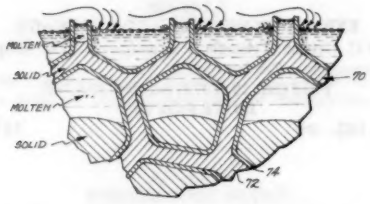
3,744,427

## FUEL GRAIN WITH OPEN-CELLED MATRIX CONTAINING LITHIUM

Carl D. Good, Seattle; Donald R. Poole, Woodinville, and Eckart W. Schmidt, Bellevue, all of Wash., assignor to Rocket Research Corporation, Redmond, Wash.

Filed Sept. 11, 1968, Ser. No. 759,041
Int. Cl. C06d *5/10*
U.S. Cl. 102—100 10 Claims



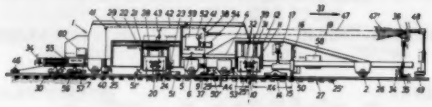

A reactor for a high specific impulse rocket motor and a method of generating a thrust with a high specific impulse propellant having a hydrogen or like working fluid. Combustion is accomplished by injecting a liquid oxidizer on a fuel grain characterized by an open-celled foamed matrix having a high degree of porosity to hold lithium or other fuel that becomes partially liquid under combustion chamber conditions. The matrix structure includes a metal, graphite or graphite-felt matrix having a melting temperature greater than the vaporization temperature of the lithium so that the liquefied lithium adheres to the matrix structure by surface tension under combustion conditions. The metal matrix may itself be a high performance fuel, such as aluminum or beryllium, coated with a metal of higher melting temperature. The fuel is loaded into the matrix structure while in a liquid state and in an inert atmosphere, either by immersion or by use of vacuum.

3,744,428

## MOBILE TRACK LEVELING AND BALLAST TAMPING MACHINE

Franz Plasser, and Josef Theurer, both of Johannesgasse 3, Vienna, Austria

Filed Apr. 7, 1971, Ser. No. 132,049
Claims priority, application Austria, Apr. 17, 1970, 3536
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 27 Claims



A track leveling and tamping machine has a plurality of tamping units whose distance from each other may be changed. Each tamping unit is mounted on a respective machine frame or frame portion which are pivotally coupled together, and a track lifting mechanism is mounted on the frame. At least one running gear mounting the frame or frame portions on the track rails is arranged between each two spaced apart tamping units, and each trailing tamping unit is arranged between a respective pair of the running gears. A reference system controls the leveling of the track.

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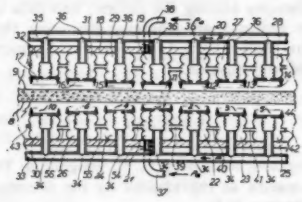
3,744,429

## GROUND-EFFECT GUIDE FACILITY FOR A MACHINE MOVING ALONG A TRACK

Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed May 17, 1971, Ser. No. 144,131
Claims priority, application France, May 20, 1970, 7018357
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 4 Claims



Ground-effect guide facility for a machine on a track by way of a series of at least two consecutive fluid cushions connected resiliently to the machine structure.

The cushions are so devised that the forces transmitted to the structure decrease with effect from a pivot cushion. The resilient connecting assemblies between the cushions and the machine structure are balloons supplied with fluid through calibrated entry orifices, the balloons being formed with calibrated outlet orifices so that the pressure in any balloon is at a predetermined mean value.

This facility is of use for tracked ground effect machines.

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3,744,430

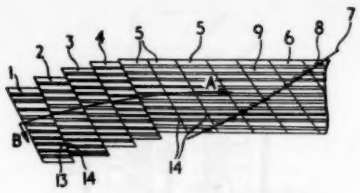
## PLATFORM CONVEYORS

Paul Zuppiger, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge/Geneve and Dunlop Holdings Limited, London, England

Filed May 17, 1971, Ser. No. 143,989
Claims priority, application Great Britain, May 22, 1970, 24,857/70
Int. Cl. B65g *21/16*
U.S. Cl. 104—25 5 Claims

A platform conveyor comprising a variable speed portion in which the platforms move relative to one another wherein

each platform has grooves provided in the load-bearing surface for combing at the ends of the conveyor. The sides of the



grooves are sloping so that the lateral movement adjacent platforms vertically displaces obstructing matter from the grooves.

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**3,744,431**

**CONVEYOR SYSTEMS**

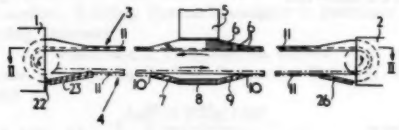
**Alan Cumberbirch, Fleet, England, assignor to Dunlop Holdings Limited, London, England**

**Filed July 6, 1971, Ser. No. 159,705**

**Claims priority, application Great Britain, July 6, 1970, 32,609/70; July 17, 1970, 34,711/70; July 10, 1970, 33,521/70**

**Int. Cl. B65g *21/16***

**U.S. Cl. 104—25** **8 Claims**



A Conveyor system for passengers or goods having low-speed, high-speed and intermediate variable speed sections. The Conveyor utilizes platforms which are driven in the high-speed section by means of a moving cable beneath the platforms, the latter having connectors for snap-on and-off engagement to drive or release the platforms in the high-speed section, of which the following is a specification.

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**3,744,432**

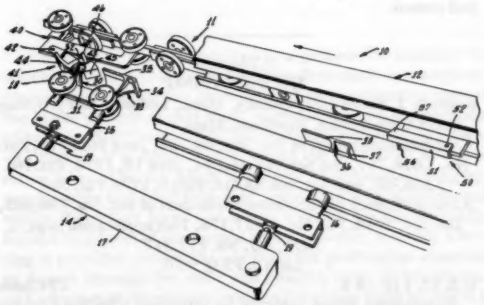
**TROLLEY DIVERTER**

**Peter P. Price, Cascade, and Nathan C. Snyder, Grand Rapids, both of Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.**

**Filed July 28, 1971, Ser. No. 166,871**

**Int. Cl. B65g *17/42***

**U.S. Cl. 104—172 S** **10 Claims**



The system has over and under propelling member and trolley tracks of constant spacing. The propelling member has a depending driving arm for engaging the trolleys and a normally retracted pivoted, ramp actuated, pusher arm for effecting final discharge of the trolleys where the tracks pass through a switch point. The same ramping system may be used to effect a positive propelling member to trolley lock of one or both arms where the system incorporates a vertical incline. The ramps may be retractably mounted to provide selectivity in operation.

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**3,744,433**

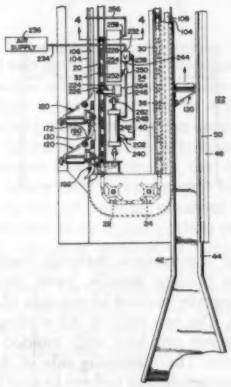
**APPARATUS FOR MOVING A VEHICLE ALONG A PATH OF TRAVEL**

**Donald A. Bernardi, Camp Hill, Pa., assignor to Bernardi Bros., Inc., Harrisburg, Pa.**

**Filed June 30, 1971, Ser. No. 158,365**

**Int. Cl. B65g *17/38*; B61b *13/12*; B65g *19/00***

**U.S. Cl. 104—172 B** **18 Claims**



Apparatus for moving a vehicle along a path of travel such as through a washing installation includes an endless horizontally disposed drive chain having a return path outside of the path of travel of the vehicle, a plurality of on-demand roller assemblies for selectively engaging a wheel of the vehicle, a drive motor for the chain, a self-lubrication assembly, staggered load-bearing surfaces for supporting the roller assemblies regardless of the degree of wear adjustment to the apparatus, and a unitary slack take-up and drive assembly, and wherein the apparatus is surface-mounted for convenient installation, access and maintenance.

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**3,744,434**

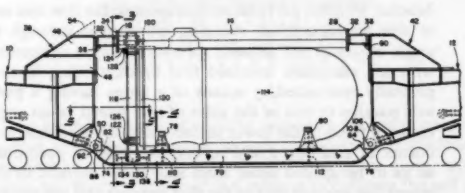
**SCHNABEL-TYPE RAILROAD CAR**

**Rudolph R. Patrick, North Olmsted, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio**

**Filed Dec. 15, 1971, Ser. No. 208,373**

**Int. Cl. B61d *3/16***

**U.S. Cl. 105—367** **13 Claims**



There is provided as an improvement in the Schnabel-type railroad car a removable cradle to enable handling of struc-

tures or vessels which cannot themselves become a part of the Schnabel-type car. The apparatus is characterized by beam means for coaction in compression between the separable wheeled parts of the Schnabel car, separate beam means for coaction in tension between the separable wheeled portions and including means for supporting the vessel on its side and out of contact with the separable wheeled portions, and means coacting between the compression beam means and the tension beam means for stabilizing such compression and tension beam means against parallelogrammatic movement.

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**3,744,435**

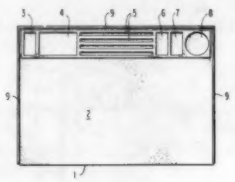
**DESK PAD AND PROCESS FOR MAKING THE SAME**

**Charles W. Tracy, and Julian V. Smith, both of Tallahasse, Fla., assignors to Evans Specialty Co., Inc., Richmond, Va.**

**Filed July 7, 1971, Ser. No. 160,354**

**Int. Cl. A47b** *85/00, 27/00*

**U.S. Cl. 108—26** **4 Claims**



Desk pad of a polymeric material having a plurality of receptacles for holding pencils, pens, paper clips, rubber bands, etc., integrally molded to one side of a flat rectangular writing surface. The two sides of the wirting surface adjacent the receptacles are provided with molded ridges to ensure structural rigidity. The remaining side of the writing surface curls under in perpendicular fashion to abut the drawer side of the desk surface. The desk pad can be affixed to the desk by using two-way adhesive tape. Also disclosed is a vacuum-forming process for making the desk pad.

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**3,744,436**

**FOLDING TABLE**

**Leonida Castelli, and Giancarlo Piretti, both of Bologna, Italy, assignors to Anonima Castelli s.a.s, Bologna, Italy**

**Filed June 17, 1971, Ser. No. 154,088**

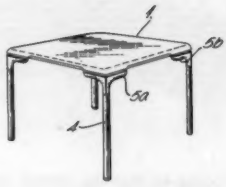
**Claims priority, application Italy, July 23, 1970, 52342 A/70**

**Int. Cl. A47b** *3/00*

**U.S. Cl. 108—125** **4 Claims**

A folding table comprising an upper board or plate forming the bearing plane of the table which is supported by legs pivotally connected to the lower surface of said board in order to be turned against said lower surface or to be arranged in a position perpendicular to said board,as the table is in use position, characterized by the fact that:

each leg is indepedent from the other and is constituted by a stanchion, to the upper end of which is connected as an integral part a sidewardly extending vertical bracket, to which is pivotally connected a second similar vertical bracket which is movable with respect to the first one and is able to accomplish swinging movements through an angle of about 90° around an axis which is concentric with the stanchion axis,said first bracket being in turn pivotally connected,by means of a hinge having a pivot axis parallel to one of the sides of said board, to an angle element fixed to the lower surface of said board near one corner of said board,said second hinge being positioned so as to be spaced apart from said lower surface of the board just enough that as the first bracket and the second bracket are in abutting relation,both said brackets can be turned against said lower surface with the second bracket sandwiched between the first bracket and said board,limit stop means being provided to limit the movement of the movable parts and resilient locking means being further



provided to hold the parts of the folding table in their operative position.

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**3,744,437**

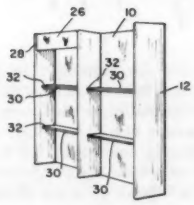
**EXHIBIT BOOTH CONSTRUCTION AND METHOD OF ASSEMBLY THEREOF**

**Ian A. Tesar, 121 S. Compo Road, Westport, Conn., and Mark D. Robbins, Old Mill Road, Greenwich, Conn.**

**Filed Jan. 26, 1971, Ser. No. 109,863**

**Int. Cl. A47b** *3/06*

**U.S. Cl. 108—153** **2 Claims**



A light weight exhibit booth that is capable of a great variety of configurations with options, such as display shelves and advertising headers. The entire construction can be assembled and disassembled in a short period of time without the use of tools. The panels are bendable to various radii and covered with impervious paper. The booth can be easily transported and reused.

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**3,744,438**

**INCINERATING**

**Kenneth J. Southwick, Quincy, Mass., assignor to Pyro-Magnetics Corporation, Needham, Mass.**

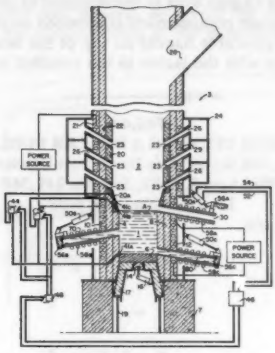
**Continuation-in-part of Ser. Nos. 44,788, June 16, 1970, Pat. No. 3,616,767, and Ser. No. 46,694, June 16, 1970, Pat. No. 3,616,768, and Ser. No. 53,416, July 9, 1970, Pat. No. 3,648,629, each is a continuation-in-part of Ser. No. 786,685, Dec. 24, 1968, Pat. No. 3,527,178. This application Sept. 2, 1971, Ser. No. 177,317**

**Int. Cl. F23g** *5/10*

**U.S. Cl. 110—8 E** **27 Claims**

Incinerating refuse material by providing adjacent first and second zones, the first zone being a heat generating zone in which a mass of material is heated to provide a high tempera-

ture environment, and the second zone being an incineration zone communicating with the first zone into which refuse



material and fluids which promote and/or support the incineration of the refuse material are introduced.

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**3,744,439**

## METHOD OF SUPPLYING REFUSE TO A GAS PRODUCING CHAMBER FOR DISPOSAL OF THE REFUSE AND A REFUSE DISPOSAL PLANT COMPRISING A GASIFICATION CHAMBER

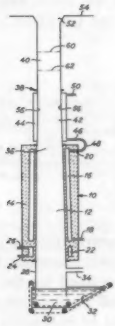
**Erik Laustsen, Kolding, Denmark, assignor to Destrugas A/S, Kolding, Denmark**

**Filed Nov. 2, 1970, Ser. No. 85,982**

**Claims priority, application Denmark, Oct. 31, 1969, 5750/69**

**Int. Cl. F23g *3/00***

**U.S. Cl. 110—11** **7 Claims**



A method of supplying refuse to a gasification chamber by which the refuse is introduced into a feed shaft communicating with the gasification chamber and, in a preheating zone at the lower portion of said shaft, is preheated to a temperature of between 100°C and 400°C for providing superheated steam, and further it is ensured that within the feed shaft always a refuse layer of such a height is present, that steam moving upwards within said shaft from said preheating zone is condensed within the refuse layer and forms a steam pocket upwardly limited by a layer of condensed steam or water, whereby a barring is provided preventing gas from the gasification chamber to depart through the shaft and keeping most of the oxygen and nitrogen of the air contained in the refuse back so that it is prevented that this oxygen and nitrogen is introduced into the gasification chamber.

**3,744,440**

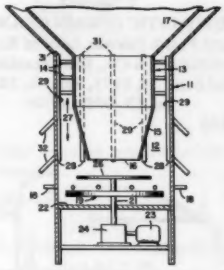
## BURNER FOR LIGHT COMBUSTIBLE MATERIALS

**Orlan R. Gardner, 419 Marin Avenue, Mill Valley, Calif.**

**Filed July 19, 1971, Ser. No. 163,869**

**Int. Cl. F23g *7/00***

**U.S. Cl. 110—18 R** **11 Claims**



A method and two embodiments of apparatus for providing efficient combustion wherein air and combustible materials are introduced into a bottom portion of a vertical chamber which is substantially open at its top, the combustible material being dispersed upwardly through a combustion zone with combustion products exiting through the open top of the chamber, gases which tend to be trapped beneath the combustion zone being vented from the chamber through suitable conduits and returned to an upper portion of the chamber if desired for more complete combustion. One embodiment of the apparatus includes a feed duct extending downwardly through the chamber for introducing combustible material thereinto. Another embodiment of the apparatus includes a feed assembly with a hopper and feed mechanism for respectively receiving combustible material and urging it upwardly through a feed duct into the chamber.

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**3,744,441**

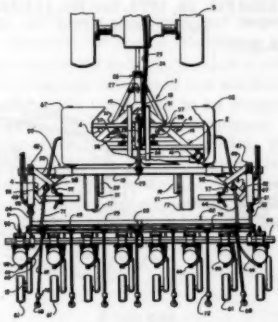
## EARTH WORKING AND PLANTING APPARATUS AND METHOD

**Donald D. Smith, and Richard J. O'Dowd, both of c/o Ace Industries, P.O. Box 353, Colby, Kans.**

**Filed Sept. 27, 1971, Ser. No. 184,053**

**Int. Cl. A01c *5/00***

**U.S. Cl. 111—1** **8 Claims**



An earth working and planting apparatus for use in conservation of rainfall in semi-arid agricultural areas is disclosed which includes a mobile frame pulled by a prime mover with discs and planters arranged in a manner to cultivate the soil to form furrows with spaced interruptions on dams resulting in a series of pockets or traps to prevent errosion and in case of rain to hold water until it is absorbed by the soil and to plant

seed in a plurality of rows in the beds between the pocket furrows as the pocketing and planting is performed. Planting water and pre-emergence spray may be delivered to the ground surface to aid and stimulate growth from the deposited seeds.

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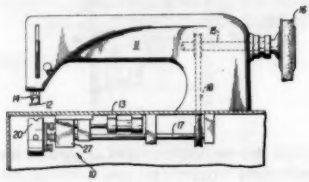
3,744,442

## AUTOMATIC BOBBIN CHANGER

Sid Michaels, and Frank Darwin, both of Knoxville, Tenn., assignors to Levi Strauss & Co., San Francisco, Calif.

Filed Sept. 24, 1971, Ser. No. 183,538
Int. Cl. D05b 59/00
U.S. Cl. 112—186 10 Claims



An automatic bobbin changer for sewing machines includes a cylindrical container for housing a plurality of bobbins in a circular array such that the uppermost bobbin may be utilized by a standard sewing machine in a conventional manner, a cycling mechanism for rotating the cylindrical container about its longitudinal axis to move a new bobbin into an operative position, a clutch-brake device positioned between a drive motor of the cycling mechanism and the sewing machine drive for declutching and braking the main drive of the sewing machine while the bobbin cylinder is being cycled and for disengaging the brake and reengaging the clutch after the bobbin has been cycled to resume sewing, and a control system for counting the stitches sewn from a particular bobbin and for actuating the cycling mechanism after a predetermined number of pieces have been sewn with a predetermined number of stitches in each and simultaneously operating the clutch-brake device.

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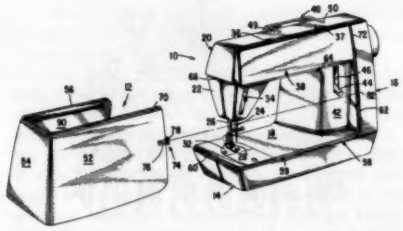
3,744,443

## COMBINATION SEWING MACHINE HOUSING AND CARRYING CASE

Wayne A. Current, Cranford, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,213
Int. Cl. D05b 77/00
U.S. Cl. 112—258 6 Claims



A sewing machine housing having a base with a work support, a standard upstanding at one end of the base, a bracket arm extending from the upper end of the standard, overlaying the work support, and terminating in a sewing head. A one-piece jacket is provided for concealing the sewing instrumentalities and the work support. The jacket has a front panel, a rear panel and an end panel integral with the front and rear panels so that the front and rear panels each have one free end with a latch member provided thereon. The free ends of the front and rear panels are slidably positioned relative to the bed and arm into abutting relationship with the standard and the latch members engage slots in the standard to lock the jacket in place. A storage compartment is provided on the interior of the jacket. A pivotable handle on top of the bracket arm allows the frame with the jacket in the installed position to be carried.

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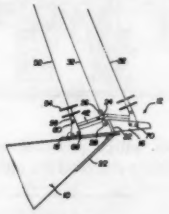
3,744,444

## DEVICE FOR STOWING A ROLLER FURLING JIB

James F. Baer, 608 Second Key Drive, Fort Lauderdale, Fla.

Filed Apr. 5, 1972, Ser. No. 241,360
Int. Cl. B63h 9/06, 9/08
U.S. Cl. 114—106 11 Claims



A roller furling jib stowage device including a base having two openings spaced on opposite sides of a mount for receiving a headstay, and an arm which pivots about the mount and has a connector for affixing the arm at either of said openings. The arm further has an opening, which may be in the connector, for receiving the jib, so that the jib may be positioned either fore or aft of the headstay by swinging the arm about the mount.

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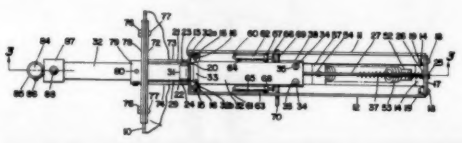
3,744,445

## BOAT FENDER OR BUMPER

John F. Malenka, 6194 Wallace Boulevard, North Ridgeville, Ohio

Filed Oct. 18, 1971, Ser. No. 190,244
Int. Cl. B63b 59/02
U.S. Cl. 114—219 8 Claims



A boat fender or bumper device is provided for cushioning the impact of a boat with another boat, or a wharf or dock. The device is characterized by the use of a compact frame mounted within the hull or gunwale of the boat, and having an impact bar movable to an extended operative position exteriorly of the hull, and to an inoperative position substantially entirely within the hull. Means are provided for locking the impact bar in extended or operating position, and for locking it also in retracted or inoperative position. A novel arrangement of a cable and spring tensioning means is utilized for cushioning and controlling the impact.

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3,744,446

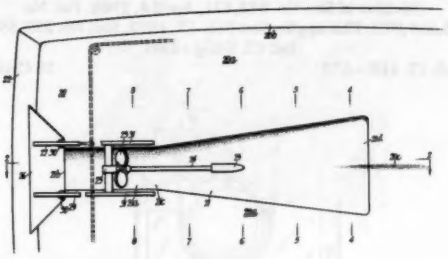
## PROPELLER DRIVEN BOATS

Frank Billington Gibbins, 297 Boundary Road, Mordialloc, Victoria, Australia

Filed Dec. 23, 1971, Ser. No. 211,552
Claims priority, application Australia, Dec. 24, 1970, 3599
Int. Cl. B63h 5/06
U.S. Cl. 115—39 8 Claims

The hull of a propeller driven planing boat powered by an inboard engine is provided on the underside thereof with a

channel extending longitudinally of the hull from the stern towards the bow, with the channel being of maximum depth at the stern to accommodate a propeller therein adjacent the stern, said channel widening and becoming shallower until it merges with the hull surface, and with the cross-sectional perimeter of the channel being of the same length along the



length of the channel so that the surface area of the channel remains constant as a wetted area throughout the length of the channel. This provides a contour of the channel adapted to ensure that water will flow, during motion of the hull, through the channel without producing eddy currents, cavitation, aeration or other fluid flow effects likely to affect the operating efficiency of the propeller in the channel.

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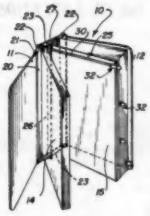
**3,744,447**
**BOOK MARKER**
**Lon Hernon, 7736 N. Eastlake Terrace, Chicago, Ill.**
**Filed Aug. 7, 1972, Ser. No. 278,546**
**Int. Cl. B42d** *9/00*
**U.S. Cl. 116—119** **4 Claims**



A bookmarker adapted to be removably secured between the pages of a book and having a flexible marker arm to which is affixed to the end thereof an extension member carrying indicia for indicating a sequential order and an indicator which can be positionally set to indicate or to direct attention to the left or right opened page of the book.

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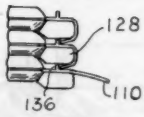
**3,744,448**
**MEANS TO DISPENSE STERILE SHEET-LIKE COMPONENTS**
**Philip Boone, 15 Fenwick Road, Winchester, Mass.**
**Continuation-in-part of Ser. No. 678,600, Oct. 27, 1967, abandoned, and a continuation-in-part of Ser. No. 715,768, March 25, 1968, Pat. No. 3,652,174. This application Mar. 27, 1972, Ser. No. 238,578**
**Int. Cl. B43k** *5/14*
**U.S. Cl. 118—37** **19 Claims**

Treated sheets or pads are each encased in a hertically sealed sheath and stacked within a housing. At least one packet is aligned with a restricted dispensing opening of the housing. A tab is operatively associated with a weakened portion of said aligned packet and adapted to be drawn through said opening whereby said weakened portion is ruptured and continued pulling on said tab effects withdrawal of one of said sheath or treated element from the housing while the wall




defining the restricted opening retains the other one of said sheath or treated element.

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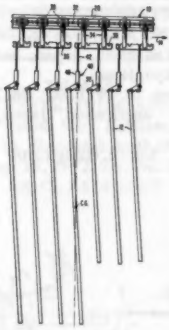
**3,744,449**
**ARTICLE HANGING, CONVEYING, AND COATING APPARATUS**
**Barney C. Guttman, Pittsburgh; William J. Suchy, East Pittsburgh, and Vincent J. Berardinelli, Murraysville, all of Pa., assignors to National Steel Corporation, Pittsburgh, Pa.**
**Filed Apr. 28, 1971, Ser. No. 138,095**
**Int. Cl. B05c** *5/00, 11/14*
**U.S. Cl. 118—324** **11 Claims**



Articles (e.g., aluminum extrusions) are suspended from a conveyor for transport through a continuous painting line. The articles are suspended by hangers, each of which includes a gripper plate swingably connected to a stabilizer plate. The stabilizer plate is rigidly connected to an elongated member which is swingably connected to the conveyor. The gripper plate has slots which receive the articles, and enlarged recesses which allow relative swinging movement between the article and the gripper plate so that the extrusion operatively engages gripper corners of the gripper plate. The gripper corners securely hold the extrusion by action of gravity tending to swing the extrusion in lever fashion to jam the extrusion between the gripper corners.

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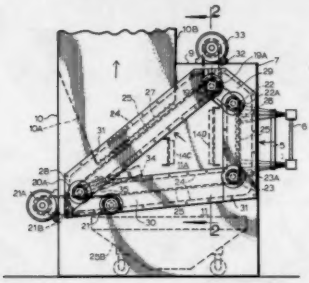
**3,744,450**
**DEVICE FOR RECLAIMING DRY POWDER PARTICULATES**
**Sheila Hardy, 400 North Avenue, Bartlett, Ill.**
**Filed Nov. 19, 1971, Ser. No. 200,451**
**Int. Cl. B05b** *1/28, 15/04*
**U.S. Cl. 118—326** **5 Claims**

A moveable backdrop filter element mounted for travel over a plurality of rollers and arranged for collecting and

reclaiming surplus dry powder particulates, such as used in electrostatic deposition systems. A particular feature of the invention is the ready interchangeability of the filter elements to permit the rapid change of deposition colors.



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**3,744,451**

**DEVELOPING DEVICE OF THE MAGNETIC BRUSH TYPE FOR ELECTROPHOTOGRAPHIC APPARATUS USING A DRY DEVELOPER**

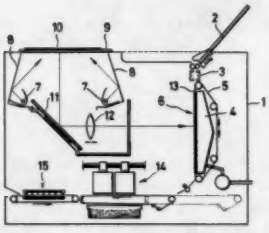
Yutaka Koizumi, Kanagawa, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 20, 1971, Ser. No. 209,521

Claims priority, application Japan, Dec. 28, 1970, 45/119415

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 10 Claims



A developing device of the brush type for electrophotographic apparatus using a dry developer comprising pivotal magnet units on whose undersides a magnetic brush composed of powdered dry developer is formed, a developer supplementing pan disposed beneath the magnet units containing a quantity of the dry developer for delivering a fresh supply to the magnet units, a mechanism for relatively moving the pan and the magnet units toward and away from each other, and a photosensitive sheet conveyor interposed between the magnet units and the developer supplementing pan. The conveyor is of the endless belt type and can be moved between a developing position, wherein the endless belt is driven, and a retracted position, wherein the endless belt is stationary, permitting the magnet units and the developer pan unobstructed relative movement while the conveyor is disposed in its retracted position.

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**3,744,452**

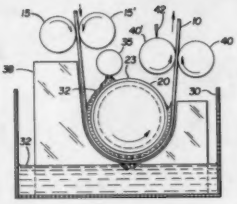
**ELECTROSTATIC DEVELOPING SYSTEM WITH CYLINDRICAL DRUM LIQUID CONTACT UNIT**

Joseph Savit, Glencoe; Rudolph P. Guzik, Chicago; Harry A. Wayne, Evanston; Arvind R. Saklikar, Park Forest, and Jack M. Van Eck, Chicago, all of Ill., assignors to American Photocopy Equipment Company, Evanston, Ill.

Division of Ser. No. 813,531, April 4, 1969, Pat. No. 3,669,073. This application Feb. 17, 1972, Ser. No. 227,559

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 16 Claims



Liquid developer system for electrostatic printing. Latent images carried on a sheet or web are developed by distributing a liquid carrier containing toner particles over a foraminous cylindrical drum. The latent image surface is contacted with the liquid developer carried on the drum, and excess liquid is removed from the contact area through small openings in the drum surface.

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**3,744,453**

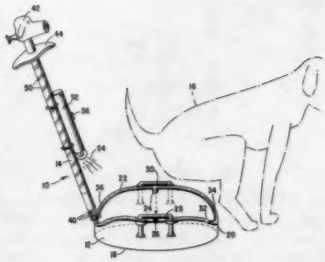
**SANITARY WASTE RECEIVER AND GUIDE ROD DEVICE FOR DOGS**

Gershon Deitch, 553 Chelsea Road, Oceanside, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,614

Int. Cl. A47f *13/06*

U.S. Cl. 119—1 3 Claims



A sanitary waste receiver and guide rod is disclosed for use with dogs, whereby their waste products or droppings may be received and disposed of in a sanitary manner. The device consists of a disposable pouch and a reusable guide rod adapted to be removably attached to the pouch.

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**3,744,454**

**ROCK AND GRAVEL BED SIMULATION FOR AQUARIUMS**

Allan H. Willinger, New Rochelle, and Albert J. Dinnerstein, Far Rockaway, both of N.Y., assignors to Metaframe Corporation, Clifton, N.J.

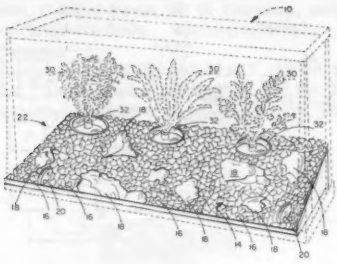
Filed June 4, 1971, Ser. No. 150,061

Int. Cl. A01k *64/00*; B44f *9/04*

U.S. Cl. 119—5 7 Claims

An article for simulating a natural appearance of a rock, sand and gravel bed, the article comprising a deformed blank. The blank is generally vacuum-formed and provided with an

upper exposed surface having a roughened texture. The roughened texture either alone or in combination with other elements secured thereto acts to simulate aquatic-bed particle matter. The blank furthermore is provided with enlarged



recesses for receiving plant replica, rock, sand and gravel to stereoscopically cooperate with the roughened texture of the blank to further enhance simulation of a natural rock, sand and gravel bed.

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**3,744,455**

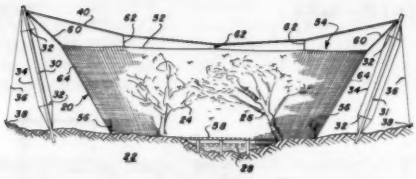
**CABLE AVIARY STRUCTURE AND METHOD OF ERECTING THE SAME**

**James M. Fowler, 1837 N. Hudson St., Chicago, Ill.**

**Filed Nov. 1, 1971, Ser. No. 194,290**

**Int. Cl. A01k** *31/06*

**U.S. Cl. 119—17** **32 Claims**



A large aviary structure in which the natural habitat of the birds housed therein can be realistically simulated, with the confining walls and roof of the structure being so unobtrusive and so well camouflaged as to produce in the visitor to the aviary the illusion that the birds are not artificially confined at all but are free to fly wherever they desire.

The side walls and roof of the structure are formed of a light weight, open mesh material that is preferably gray-green in color and adapted to have vines grow upon the mesh. The roof and side walls are supported by a relatively small diameter roof-defining cable, which is surrounded by a roof-supporting framework of catenary cables of relatively larger diameter, which framework surrounds and is spaced above and outside the roof-defining cable. Various combinations of catenary cables that form roof-supporting frameworks are disclosed.

Typically, the roof-supporting catenary cable framework is in turn supported by more or less vertical support poles. The distance separating the roof-defining cable from the catenary cable framework and the support poles renders the cable framework and poles virtually unnoticeable to one standing inside the aviary structure.

The side walls are preferably inclined outwardly from the bottom to top of the aviary structure.

A method of erecting the cable aviary structure is also disclosed.

**3,744,456**

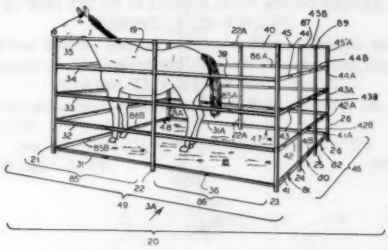
**WALLED ENCLOSURES**

**Ralph Wheeler, Waterflow, N. Mex., and Leroy P. Young, P.O. Box 511, Kirkland, N. Mex.**

**Filed Apr. 12, 1971, Ser. No. 133,142**

**Int. Cl. A01k** *01/00*

**U.S. Cl. 119—20** **7 Claims**



Bend resistant and torsion yielding panel members form panel assemblies, with firm yet detachable connection between the panel assemblies in a knock down construction corral. This construction provides straight line relations between edges and members of the adjacent panel assemblies in absence of stress applied thereto and provides a gentle yet firm snubbing action through an elastic yielding of the panel assemblies when impact is applied thereto by an animal penned therein without any pinching or scratching of the animal. Other walled enclosures of the same construction are applied to truck bodies.

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**3,744,457**

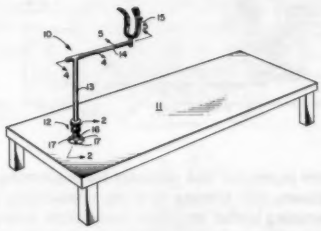
**ANIMAL RESTRAINING APPARATUS**

**Joseph O. Heine, 61 James Way, Scituate, and Duwayne Simmons, 84 Pleasant St., Randolph, both of Mass.**

**Filed Aug. 15, 1972, Ser. No. 280,823**

**Int. Cl. A61d** *03/00*

**U.S. Cl. 119—103** **5 Claims**



Animal restraining apparatus which is table mounted and which engages the hind quarters of an animal to immobilize the animal against vertical movement while permitting horizontal movement and substantially free access to the body of said animal.

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**3,744,458**

**ONCE-THROUGH BOILER WITH SUSPENDED TUBE SYSTEM**

**Hermann Bruckner, and Werner Emsperger, both of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany**

**Filed July 8, 1971, Ser. No. 165,820**

**Claims priority, application Germany, July 11, 1970, P 20 34 464.3**

**Int. Cl. F22b** *37/24*

**U.S. Cl. 122—6 A** **6 Claims**

In a once-through boiler having vaporizer heating surface members, in the form of a tightly welded helical winding of

tubes, suspended on unheated downcomer tubes, the helical winding of tubes is fixedly connected only at upper and lower

ends thereof to the downcomer tubes, while it is connected slidingly to the downcomer tubes at locations intermediate the fixed connections.

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**3,744,459**

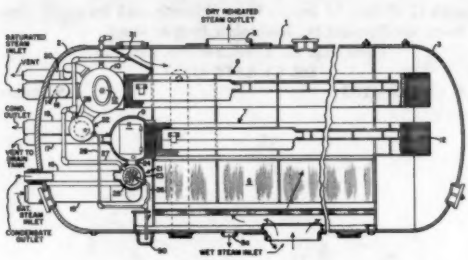
## CONDENSATE DRAIN SUBCOOLER FOR MOISTURE SEPARATOR AND REHEATER

**William G. Reed, Cumberland Foreside, Maine, assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 12, 1971, Ser. No. 188,090**

**Int. Cl. F22g *1/04***

**U.S. Cl. 122—483** **2 Claims**




A moisture separator and reheater for separating moisture from wet steam and heating it using condensing-type tube bundles operating under saturated conditions incorporates a special heat exchanger in the condensate drain line to subcool the condensate and prevent instability or cavitation in the drain. The subcooling heat exchanger boils liquid taken from the moisture separator and reheater cycle to perform the condensate cooling.

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**3,744,460**

## ELECTRONIC FUEL INJECTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Louis Monpetit, L'Etang La Ville, France, assignor to Societe Des Procedes Modernes D'Injection Sopromi, Les Mureaux, France**

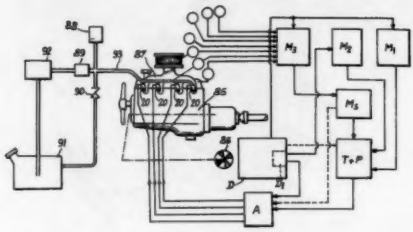
**Filed Apr. 21, 1971, Ser. No. 136,002**

**Claims priority, application France, Apr. 28, 1970, 7015452**

**Int. Cl. F02b *3/00***

**U.S. Cl. 123—32 EA** **11 Claims**

A fuel injecting system providing an accurate adjustment of the duration of injection, the operative cycle being subdivided into a first stage during which the energy required for injection or the corresponding information is stored in a condenser which is discharged during the second or injection stage. The shifting from one stage to the other is controlled by two switches constituted by transistors acting in alternation so as to energize during a predetermined stage a unijunction




transistor controlling the starting and stopping of the injection in conformity with a number of parameters stored in memories. The original signals fed into the system are advantageously produced by an oscillator operating for predetermined angular positions of the crankshaft.

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**3,744,461**

## METHOD AND MEANS FOR REDUCING EXHAUST SMOKE IN I.C. ENGINES

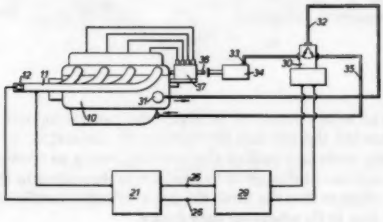
**John Derek Davis, Beaconsfield, England, assignor to Ricardo & Co., Engineers (1927) Limited, Sussex, England**

**Filed Sept. 3, 1971, Ser. No. 177,569**

**Claims priority, application Great Britain, Sept. 4, 1970, 42,487/70**

**Int. Cl. F02b *3/00*; F02d *1/04***

**U.S. Cl. 123—32 EA** **7 Claims**



An internal combustion engine having a fuel pump whose control rack is provided with an adjustable stop for limiting the maximum quantity of fuel delivered to the engine, is provided with an electrohydraulic control circuit coupled to the said stop for automatic reduction of the maximum fuel delivery in response to the occurrence of an increase in smoke density in the gaseous exhaust from the engine exhaust duct. An electrode assembly mounted in the exhaust duct and insulated therefrom receives an electrical charge from the charged carbon smoke particles impinging upon it, and the resultant potential developing on the electrode is continuously measured as a signal dependent upon exhaust smoke density, and is supplied as an input signal to the electrohydraulic control circuit. The output member of the control circuit is a hydraulic plunger whose movable member comprises the said adjustable stop.

3,744,462

## LIQUID COOLED RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINE

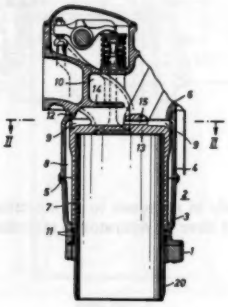
Otto Herschmann, Schorndorf; Hermann Mettig, Bodenkirchen; Bernhard Medenus, Bensberg-Lustheide; Hans-Ulrich Howe, Bensberg-Frankenforst, and Hans-Jurgen Klatte, Cologne-Deutz, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Continuation-in-part of Ser. No. 54,817, July 14, 1970, abandoned. This application July 3, 1972, Ser. No. 268,640

Claims priority, application Germany, July 16, 1969, P 19 36 022.6

Int. Cl. F02f *1/02, 1/04, 1/10*

U.S. Cl. 123—41.31 8 Claims



A liquid-cooled reciprocable piston internal combustion engine with a crank-case extending into the region of the foot portion of a cylinder while adjacent said crank-case there is provided a jacket surrounding said cylinder and forming therewith a first cooling fluid receiving chamber, while the cylinder head and said cylinder together form a structural unit which is inserted between and rests against the cylinder head and the crank-case, said first cooling fluid receiving chamber means communicating through passage means with second cooling fluid receiving chamber means in the cylinder head.

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3,744,463

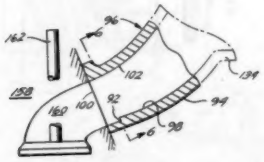
## INTAKE MANIFOLD FOR INTERNAL COMBUSTION ENGINES HAVING A SUDDEN ENLARGEMENT IN THE FLOW PATH OF EACH RUNNER

James D. McFarland, Jr., Chatsworth, Calif., assignor to Edelbrock Equipment Company, El Segundo, Calif.

Filed Apr. 2, 1971, Ser. No. 130,329

Int. Cl. F02b *75/22*

U.S. Cl. 123—52 MV 20 Claims



A sudden enlargement, in the form of a step, is provided proximate the entrance of each runner of a manifold to the ports of an engine and where mixture velocity is relatively low with respect to mixture velocity elsewhere in the same velocity profile. The enlargements control reverse mixture flow and increase the amount of mixture entering the engine's cylinders. It is believed that this increase in flow is partially due to a reduction or elimination of boundary layer separation in the inlet port. The geometry of the runners is such as to promote relatively high mixture velocity. Specifically, the cross-sectional area of each runner progressively diminishes downstream from the entrance to the runner at the manifold's plenum.

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3,744,464

## ARRANGEMENT FOR CONTROLLING THE PRESSURE IN THE INLET MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

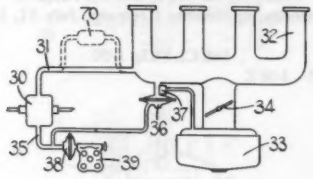
John Peter Soltau, Solihull, Warwickshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 21, 1971, Ser. No. 108,410

Claims priority, application Great Britain, Mar. 20, 1970, 13,694/70

Int. Cl. F02b *33/00*; F02m *23/04*; F02d *31/00*

U.S. Cl. 123—119 D 5 Claims



An arrangement for controlling the pressure in the inlet manifold of an internal combustion engine has a speed-responsive valve in a passage communicating with the manifold, and a control device responsive to the pressure downstream of the speed-responsive valve and to the manifold pressure, the arrangements being such that when the engine speed is above a predetermined level and the manifold pressure is below a predetermined level the control device admits additional air to the manifold.

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3,744,465

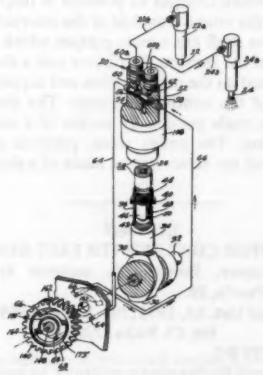
## HYDRAULIC SHUTTLE VAVLE FOR FUEL INJECTION PUMPS

James R. Voss, Wilbraham, and A. Frank Jeney, Westfield, both of Mass., assignors to AMBAC Industries, Inc., Springfield, Ill.

Filed Jan. 24, 1972, Ser. No. 220,203

Int. Cl. F02m *41/04*

U.S. Cl. 123—139 AM 22 Claims



The output of a fuel injection pump plunger is alternately directed to a pair of injection nozzles by a hydraulically actuated shuttle valve. A shuttle housing incorporated into the high pressure circuit includes a bore containing the valve shuttle which is reciprocated by alternating fuel pressure in-

troduced at each end of the bore. The alternating pressurized fuel is supplied to the bore in timed relationship with the reciprocation of the pump's plunger by a rotary distributor driven by the pump cam shaft. Means are provided in the shuttle to interconnect the shuttle actuating and the injection pump high pressure passages during the intervals between fuel injection to establish a controlled low pressure level in the high pressure passages prior to the next injection.

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**3,744,466**

**IGNITION DISTRIBUTOR WITH CONTROL GENERATOR FOR INTERNAL COMBUSTION ENGINES**

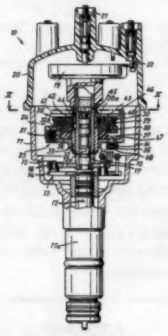
**Hartmut Brammer, Stuttgart; Gerd Hohne, Ludwigsburg; Gert Jakob, Stuttgart; Harald Kalippke, Hohenacker; Gerhard Sohner, Geradstetten; Karl Ehrmann, and Gunter Brand, both of Stuttgart, all of Germany, assignors to Bosch GmbH, Stuttgart, Germany**

**Filed July 16, 1971, Ser. No. 163,374**

**Claims priority, application Germany, July 31, 1970, P 20 38 037.4**

**Int. Cl. F02p** *1/00*

**U.S. Cl. 123—148 E** **15 Claims**



The minimal clearances between the pole teeth of the stator and rotor of the control generator in an ignition distributor for internal combustion engines are independent of eventual stray movements of the drive shaft by mounting the stator on the drive shaft so that the stator and the rotor of the control generator share all stray movements of the drive shaft but the rotor is free to rotate, without contact, relative to the stator. The stator is angularly adjustable with reference to the drive shaft by a link which changes its position in response to pressure changes in the intake manifold of the internal combustion engine. The drive shaft has a male portion which is journalled in the housing of the ignition distributor and a sleeve which is rotatably mounted on the male portion and supports the stator and the rotor of the control generator. The sleeve receives torque from the male portion by means of a centrifugal advance mechanism. The entire rotor, portions of the rotor, and/or portions of the stator can be made of a sintered material.

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**3,744,467**

**STARTER MOTOR CIRCUIT WITH FAST RESET MEANS**

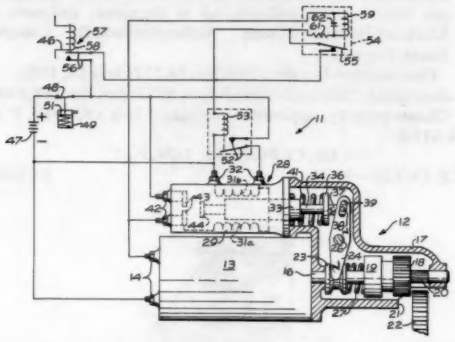
**Harold H. Wagner, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Oct. 13, 1971, Ser. No. 188,969**

**Int. Cl. F02n** *17/00*

**U.S. Cl. 123—179 BG** **2 Claims**

A control circuit for the starter motor of an engine has rapid acting and reliable means for automatically reattempting starting in the event that the pinion gear of the starter motor fails to engage the driven gear of the engine due to tooth abutment or other causes. A time delay relay periodically reopens the pinion gear shifting solenoid circuits until such time as the pinion gear is engaged at which point the time delay means is inactivated while the engine is being cranked. The quick precise response of the circuit is of particular value in connection with emergency motor-generator installations designed to



start automatically in response to an electrical power failure and which do not have an operator in attendance to actuate a starter motor.

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**3,744,468**

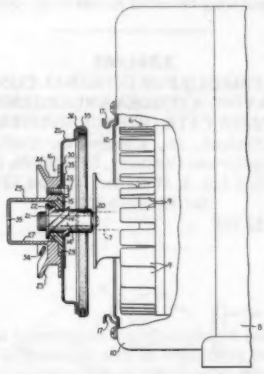
**COMBINED ROPE STARTER AND GUARD FOR GASOLINE ENGINES**

**Daniel E. Braun, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.**

**Filed May 26, 1972, Ser. No. 257,320**

**Int. Cl. F02n** *3/02*

**U.S. Cl. 123—185 A** **4 Claims**



On an engine having a flywheel blower enclosed in a shroud, a driven clutch element is fixed on the adjacent end portion of the crankshaft, spaced from the shroud. A cooperating driving clutch element is slidable and rotatable on the crankshaft between the driven element and the shroud. A rope pulley is concentrically fixed to the driving clutch element and has an apertured coaxial skirt projecting towards the shroud and releasably engageable with a clip thereon. A cup-shaped outward extension on the pulley encloses the driven clutch element.

3,744,469

## RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

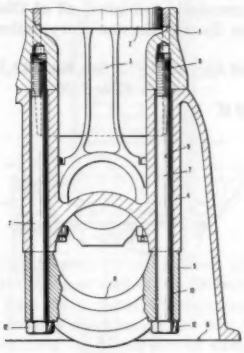
Josef Reisacher, Wendlingen; Friedrich Noltemeyer, Hohenacker kreis Waiblingen, and Albrecht Schmid, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed Apr. 22, 1971, Ser. No. 136,495

Claims priority, application Germany, Apr. 24, 1970, P 20 20 011.7

Int. Cl. F02f 7/00

U.S. Cl. 123—195 8 Claims



A reciprocating piston internal combustion engine with a cylinder block as well as with a main bearing and a main bearing cover of a crankcase which are connected with each other by bolts whereby the bolts extending from the cylinder block to the main bearing cover only engage at the same whereas they extend freely through the main bearing so that the forces acting on the main bearing are transmitted directly to the cylinder block or the main bearing cover.

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3,744,470

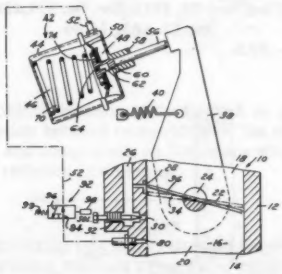
## ENGINE ANTI-DIESEL CONTROL

James R. Clarke, Northville, and Ernest J. Obermeyer, Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 29, 1971, Ser. No. 202,911

Int. Cl. F02m 19/12, 1/14; F02d 33/00

U.S. Cl. 123—198 DB 2 Claims



The throttle valve of a downdraft type carburetor is controlled in its movement by a servo in turn controlled by manifold vacuum changes; springs initially move the throttle valve to an idle speed setting for engine starting as well as engine idling; and, engine shutoff permits vacuum in a reservoir to temporarily move the throttle valve towards a closed position to prevent dieseling.

3,744,471

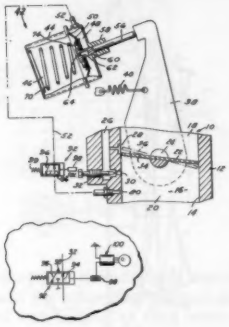
## CARBURETOR EMISSION CONTROL

Paul E. Braun, Bloomfield Hills, and Ernest J. Obermeyer, both of Orchard Lake, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 29, 1971, Ser. No. 202,912

Int. Cl. F02m 19/12, 1/14; F02d 33/00

U.S. Cl. 123—198 DB 5 Claims



A manifold vacuum controlled servo normally positions the carburetor throttle valve to an engine idle speed and start position, the servo having a vacuum reservoir and the vacuum line having an engine ignition system controlled vent valve so that upon engine ignition shutoff, the vent valve immediately connects the vacuum line to atmospheric pressure prior to the natural bleeddown of the manifold vacuum to atmospheric pressure and permits the reservoir vacuum to effect closing of the throttle valve to prevent engine dieseling and minimize emissions.

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3,744,472

## MULTIPLE-BALL AND PROJECTILE TOY

Leona C. O'Ryan, Galloway, Ohio, assignor to Joseph C. Bova, Galloway, Ohio

Filed Feb. 18, 1972, Ser. No. 227,512

Int. Cl. F41b 15/00

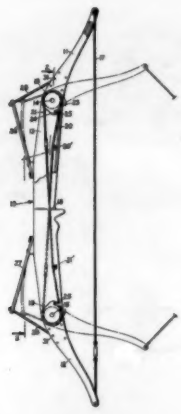
U.S. Cl. 124—1 6 Claims

A multiple-ball toy is provided having a resilient first ball and a relatively smaller second ball with the larger first ball having a socket to receive the second ball and support the second ball in stacked relationship when the socket is upwardly oriented. An impulse force applied to the resilient large ball is transmitted to the second thereby imparting a propelling force to the second causing separation and projection of the smaller second ball through the air.

## 3,744,473
## COMPOSITE ARCHERY BOW WITH BOW LIMB TENSION CONTROL DEVICE

Jim Z. Nishioka, 1268 Hemlock St., N.W., Salem, Oreg.

Continuation-in-part of Ser. No. 99,966, Dec. 21, 1970, abandoned. This application Oct. 26, 1971, Ser. No. 192,092
Int. Cl. F41b 5/00
U.S. Cl. 124—24 6 Claims

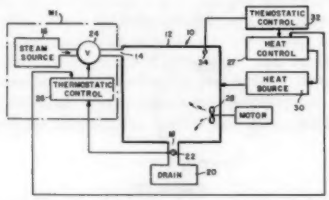


An archery bow is composed of a rigid middle portion having a pair of rotatable members supported at equal distances from the center thereof, a pair of bow arms connected to the rotatable members respectively and extending from the ends of the rigid middle portion, with the bowstring extending between the outer end of the arms, means interconnecting the rotatable members causing them to rotate in unison and in opposite directions for equalizing the movement of the bow arms, and resilient tension means controlling the rotation of the rotatable members and the movement of the arms.

## 3,744,474
## STEAM COOKING APPARATUS AND METHOD

Harold N. Shaw, Harwich, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Mar. 1, 1971, Ser. No. 122,587
Int. Cl. A21b 1/08
U.S. Cl. 126—20 9 Claims

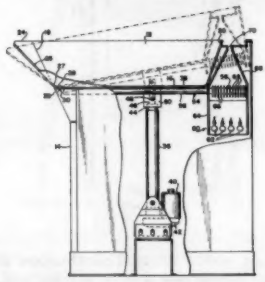



A steam cooker of the type used principally to quickly cook quantities of fresh or frozen foods, characterized by rapid attainment of cooking conditions and economical and safe use of steam. A chamber, into which the food is introduced for cooking, has an inlet passage for connection to a source of steam and a free-venting outlet passage through which displaced air and condensate are drained. Disposed in the outlet passage are temperature-sensing means which detect full displacement of air from the chamber by a rise of temperature to near that of the steam, e.g., 200°–212°F. When this condition has been attained the flow of steam from the steam source is terminated in response to the temperature-sensing means through the action of flow controlling means of a type appropriate to the particular steam source used. This temperature-sensing means may then connect heating means provided to superheat the steam in the chamber and when the outlet passage cools, the temperature-sensing means turns off the heating means and reconnects the steam. One steam flow controlling means is a solenoid-operated valve closing the inlet passage; another is a control which reduces heat to a steam boiler and another is a control which reduces the water supply to a flask steam generator.

## 3,744,475
## TILTING BRAZIER

George W. Myler; Edward A. Reid, Jr., both of Columbus, and Robert G. Venendaal, Arlington, all of Ohio, assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Filed Apr. 13, 1972, Ser. No. 243,577
Int. Cl. F24c 3/00
U.S. Cl. 126—39 R 21 Claims

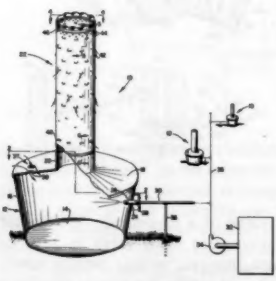


A tilting brazier including a flat cooking pan having upper and lower surfaces, has a plurality of heat pipes mechanically and thermally bonded to the lower surface of the pan in heat transfer relation therewith. The heat pipes have evaporator and condenser portions with substantially the entire condenser portion of each of the pipes being located beneath the pan while the evaporator portions thereof extend beyond the periphery of the pan. A gas fired burner positioned adjacent the evaporator portions of the heat pipes supply heat thereto so that heat supplied to the evaporator portions thereof is uniformly transmitted to the pan through the condenser portions of the heat pipes.

## 3,744,476
## ORCHARD HEATER

Richard P. Georges, 101 Fremont St., Winter Haven, Fla.

Filed Nov. 10, 1971, Ser. No. 197,420
Int. Cl. A01g 13/06
U.S. Cl. 126—59.5 8 Claims



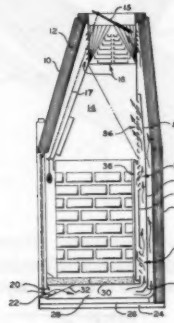
A device for converting a conventional pot burner to a centrally fueled orchard heater.

3,744,477

## FIREPLACE UNITY WITH THIN REAR FIREBOX WALL

George M. Andrews, Syracuse, N.Y., assignor to Vega Industries, Inc., Syracuse, N.Y.

Filed Oct. 12, 1971, Ser. No. 188,052
Int. Cl. F24b *1/18*
U.S. Cl. 126—120 7 Claims



A fireplace unit adapted for permanent, fully enclosed installation wherein the rear wall of the firebox or combustion chamber is of thin, sheet metal. Passageways are provided outside the combustion chamber for the flow of cooling air to substantially eliminate the possibility of damage to the rear wall due to the intense heat concentrated thereon.

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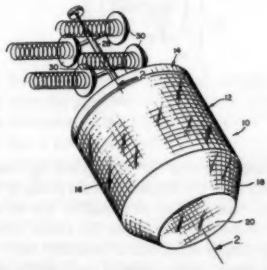
3,744,478

## THERMAL RADIATION SHIELD

Albert J. Gopin, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1971, Ser. No. 209,815
Int. Cl. F27d *21/00*
U.S. Cl. 126—270 6 Claims



Radiation shield interiorly of device such as spacecraft interrupts radiation between components on the device receiving radiation and components on the device which are aided by control of radiation environment.

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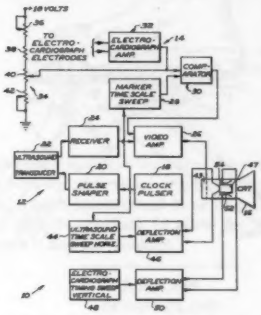
3,744,479

## SYNCHRONIZED ULTRASONIC DIAGNOSTIC FOR INTERNAL ORGAN FUNCTION TESTING

Arno Stein, Boulder; Alan R. Owens, and William L. Wright, both of Longmont, all of Colo., assignors to Picker Electronics, Inc., Longmont, Colo.

Filed Feb. 25, 1971, Ser. No. 118,920
Int. Cl. A61b *5/10*
U.S. Cl. 128—2 S 29 Claims

A clinical monitoring system including an ultrasound system which is operated in conjunction with another physiological monitoring system, such as an electrocardiograph, for providing a composite visual presentation of both ultrasound data and other physiological data. The clinical monitoring system also includes circuitry for electrically synchronizing and for combining the ultrasound data and the other physiological data so that both sets of data are simultaneously presented and




are correlated with respect to each other relative to time. The ultrasound data and the other physiological data are electrically synchronized with respect to each other and are simultaneously presented in time correlation with respect to each other.

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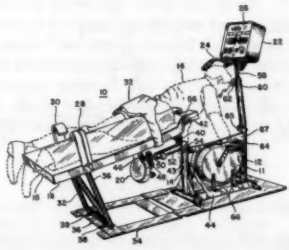
3,744,480

## ERGOMETER

Raymond L. Gause, and Bobby G. Bynum, both of Huntsville, Ala., assignors to The United States of America as represented by the administrator of the National Aeronautics and Space Administration

Filed Nov. 29, 1971, Ser. No. 202,769
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 R 6 Claims



An ergometer including a pedal driven direct current motor as a load and including a frame for supporting the body of a person in either a sitting or a prone position whereby the pedals may be operated by either the feet or the hands and the electrical circuitry of the ergometer includes means for limiting the load applied to the pedals as a function of work being performed, heart rate, and increases in heart rate.

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3,744,481

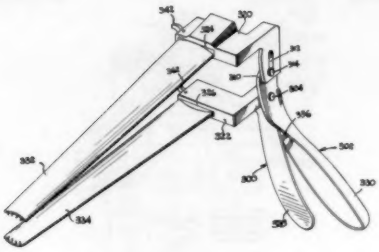
## MEDICAL EXAMINING METHOD AND MEANS

Bernard McDonald, 18212 Pacific Coast Highway, Malibu, Calif.

Filed May 18, 1971, Ser. No. 144,468
Int. Cl. A61b *1/06, 1/30, 1/32*
U.S. Cl. 128—006 16 Claims

A device for viewing the cervix and vaginal segment of a human uterus has two, three or four elongate blades removably mounted on a holder. The blades are adjustable to spread and to retain the vaginal walls including the cervicovaginal fornix for visual observation and accessibility of surgical instruments to the uterus. A handle supports the blades

and preferably has illumination sources and, optionally, a viewing lens mounted thereon. Each of the blades includes means at its distal end for securely engaging the exterior



peripheral rim of a cervix for immobilizing it during surgical procedures. The two blades are resiliently biased towards each other.

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**3,744,482**

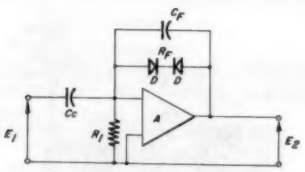
**DRY CONTACT ELECTRODE WITH AMPLIFIER FOR PHYSIOLOGICAL SIGNALS**

**William M. Kaufman, Chevy Chase, and Donald P. Powell, Baltimore, both of Md., assignors to Hittman Associates, Inc., Columbia, Md.**

**Filed June 29, 1971, Ser. No. 158,040**

**Int. Cl. A61b *5/04***

**U.S. Cl. 128—2.06 E** **12 Claims**



An electrode and amplification circuitry connected thereto mounted within a housing for capacitively coupling physiologically produced potential along the skin surface of the body to the amplification circuitry without undesirable direct current shifts in potential and with rapid recovery from saturation due to a transient by means of a Zener diode or leak-resistor circuit arrangement in the amplification circuitry.

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**3,744,483**

**PHYSIOTHERAPEUTIC MAT**

**Willi Picolin, Windeckstrasse 15, 6 Frankfurt, Main, Germany**

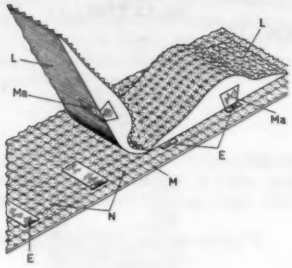
**Filed May 2, 1972, Ser. No. 249,576**

**Claims priority, application Germany, May 7, 1971, P 21 22 739.4**

**Int. Cl. A61h *1/02***

**U.S. Cl. 128—25 B** **5 Claims**

A mat for the physiotherapeutic treatment of human legs and feet is a composite structure including two tiers or layers, i.e., an elongated base layer of an elastic material having an upper surface provided with lump-like projections and a plurality of cover elements superimposed upon the upper surface of said base layer and extending transversely across the base layer. Each of said cover elements has a sinuous profile as seen in a direction transversely to said base layer. Magnetic



fastener means make it possible to secure the cover elements in various desired positions to the base layer.

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**3,744,484**

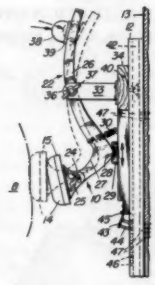
**ABDOMINAL MUSCLE TONING APPARATUS**

**Gerald A. LaTorraca, 1085 Wake Forest Drive, Toms River, N.J.**

**Filed Apr. 19, 1971, Ser. No. 135,038**

**Int. Cl. A61h *23/00***

**U.S. Cl. 128—54** **11 Claims**



A self-operated device for strengthening one's abdominal muscles by means of the impact from a padded cushion, simulated medicine ball or the like and/or the muscular pull in avoiding such impact, on or about the lower torso. The device comprises a pivotally mounted conversely bent rod having an upper cushion which when pushed away from the user will automatically force a lower cushion toward that portion of one's body to be toned thereby. The rod is pivotally mounted on a vertically adjustable rigid support which is removably secured to a member permanently attached to a wall or the like.

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**3,744,485**

**EXERCISING DEVICE FOR THE LIP AND CHEEK AREA**

**Gloria V. Worthy, 1500 N.E. 50th Court, Fort Lauderdale, Fla.**

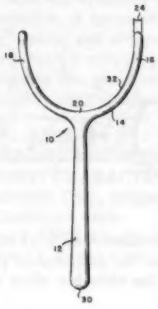
**Continuation-in-part of Ser. No. 65,818, Aug. 21, 1970, abandoned. This application Nov. 19, 1971, Ser. No. 200,446**

**Int. Cl. A61h *7/00***

**U.S. Cl. 128—67** **6 Claims**

An exercising device for the lip and cheek area adapted to be introduced into the mouth and fitted in the space defined by the user's teeth and inner lip area immediately adjacent the mouth comprising a handle and a U-shaped flange connected

thereto wherein this flange fits in the aforedescribed area whereupon with the mouth closed over the flange and the handle extending outwardly therefrom inward and outward motion may be imparted to the device to exercise the area.



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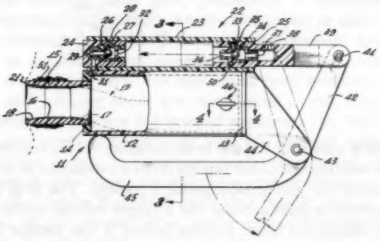
**3,744,486**
**APPARATUS FOR OBTAINING AN ARTIFICIAL ERECTION**

**Eldon M. Wilson, 8856 Encino Avenue, Northridge, Calif.**
**Continuation-in-part of Ser. No. 7,515, Feb. 2, 1970, abandoned. This application Dec. 6, 1971, Ser. No. 205,241**
**Int. Cl. A61f 5/00**
**U.S. Cl. 128—79** **20 Claims**



Apparatus for obtaining an artificial erection by inducing flow of blood into the penis to stiffen it and applying a restrictor to its base to maintain the blood therein. A barrel chamber for the penis has a restricted tubular entrance and means for creating a vacuum in the chamber to which the penis is subjected to induce flow of blood thereinto. A resilient restrictor mounted on the entrance tube is shiftable therefrom to the base of the penis after erection to maintain the blood therein. The chamber has means for releasing the vacuum after which it may be withdrawn from the erected penis which may thereafter be used in normal copulation.

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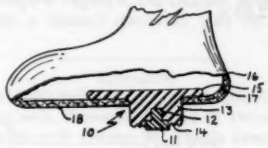
**3,744,487**
**GLIDE ASSEMBLY**

**Herbert G. Lipson, 68 Aldrich Road, Wakefield, Mass., and Bartholomew J. Spada, 52 Festa Road, Revere, Mass.**
**Continuation-in-part of Ser. No. 848,295, Aug. 7, 1969, Pat. No. 3,633,573. This application Nov. 10, 1971, Ser. No. 197,428**
**Int. Cl. A61f 5/04**
**U.S. Cl. 128—83.5** **6 Claims**

An assembly for aiding self-locomotion of a wearer of leg cast or other foot immobilizing device whereby a selective sliding motion may be utilized in place of the conventional walking motion. The assembly includes a resilient retainer having apertures into which inserts of a low coefficient of friction, which protrude slightly above the retainer, are placed. Engagement of the retainer with the surface over which locomotion is to be effected permits a sliding of the limb; however, when a predetermined weight is applied to the assembly, the resiliency of the retainer allows the inserts to be pressed inwardly into their aperture such that the surrounding retainer provides a non-slip, frictional engagement with said surface. Alternatively, each insert could have its own resilient support mounted within its aperture to allow for the relative movement between it and the retainer.



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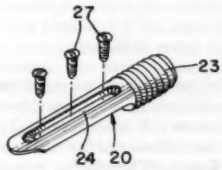
**3,744,488**
**BONE SPLINT**

**Jack R. Cox, P. O. Box 1104, Myrtle Beach, S.C.**
**Filed June 8, 1971, Ser. No. 151,089**
**Int. Cl. A61f 5/04**
**U.S. Cl. 128—92 BC** **1 Claim**



An intramedullary splint possesses a longitudinal slot whose opposite edges are formed to engage with the threads of screws securely anywhere along the length of the slot. The splint element is transversely arcuate for engagement inside of the bone canal. The interaction of the screws and slot allow the splint to be drawn up firmly against the concave wall of the bone for greatest support. The placement of metallic parts inside of the bone rather than on the outside reduces interference with muscle attachments and reduces tissue trauma.

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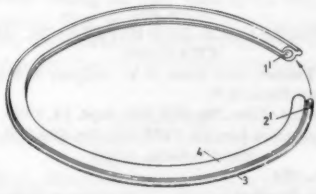
**3,744,489**
**INTRA-UTERINE DEVICE**

**Graham Donald Munro, Harlow, England, assignor to T. J. & Nephew Limited, Hull, Yorkshire, England**
**Filed Oct. 30, 1970, Ser. No. 85,395**
**Claims priority, application Great Britain, Nov. 4, 1969, 54,094/69**
**Int. Cl. A61f 5/46**
**U.S. Cl. 128—130** **6 Claims**

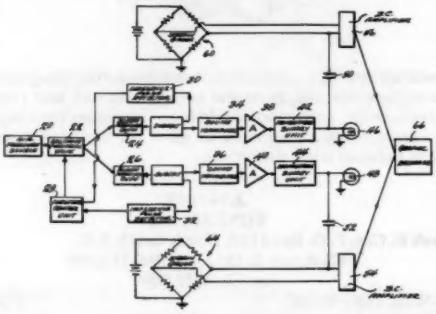


A post-partum intra-uterine contraceptive in the form of a uniform profiled strip with complementary cross-sectional areas which can interlock so that the strip can be coiled with continuous turns slidable along one another to accommodate uterine involution.

**3,744,490**
**AUTOMATIC DEVICE FOR RECORDING BLOOD PRESSURE**

**Heriberto S. Fernandez, 1822 Gaston St., Winston-Salem, N.C.**

**Filed Nov. 16, 1971, Ser. No. 199,103**
**Int. Cl. A61b** *5/02*
**U.S. Cl. 128—2.05 A** **7 Claims**



An apparatus for producing a record of systolic and diastolic blood pressure for one or more individuals whereby an inflatable blood pressure cuff is conventionally placed on a part of the body such that inflation of the cuff constricts blood flow and causes the Korotkoff sounds to appear at roughly the diastolic pressure and disappear at roughly the systolic pressure and inflated under the control of an electrical impedance detector which, for example, may be placed on one or two digits and which detects the pulsating impedance which continues until a pressure is reached which is beyond the systolic pressure and at this pressure the cuff is automatically deflated. A transducer such as a microphone is placed, for example, under the cuff to detect the Korotkoff sounds and produce a pulse train as long as these sounds are detected. This Korotkoff signal is recorded on a conventional graphic recorder together with a signal generated, for example, by a strain gauge which indicates the cuff pressure such that the systolic and diastolic pressures both during inflation and deflation can be ascertained from the beginning and end of the pulse train superimposed on the recorded cuff pressure signal. This device can be used with one cuff transducer or simultaneously with a plurality of cuffs and transducers to simultaneously produce on different channels of a graphic recorder a record of the systolic and diastolic blood pressures of a number of different individuals.

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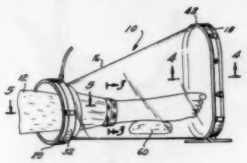
**3,744,491**
**LOW PRESSURE LOCALIZED HYPERBARIC OXYGEN CHAMBER**

**Boguslav H. Fischer, New York, N.Y., assignor to Boguslav H. Fischer, New York, N.Y.**

**Continuation of Ser. No. 858,940, Sept. 18, 1969. This application Jan. 20, 1972, Ser. No. 219,589**
**Int. Cl. A61m** *13/00*
**U.S. Cl. 128—184** **9 Claims**

A portable chamber is provided which permits the localized treatment, with low pressure oxygen, of non-healing ulcerations or lacerations of the body particularly the leg. In the case of a leg chamber, a sealing unit is adapted to be sealed to the patient's leg above the ulceration. A transparent sleeve is adapted to detachably connect with the sealing unit and a sole plate which combines to effectively enclose the affected part of the leg within the chamber about the ulceration. An oxygen inlet connection is provided into the chamber with a manometer being employed to permit monitoring of chamber pressure and a pressure release valve being employed to permit adjustment of chamber pressure. A support may also be provided on the chamber exterior for purposes of preventing undesirable tilting or rolling of the chamber when sealed to the patient's leg.



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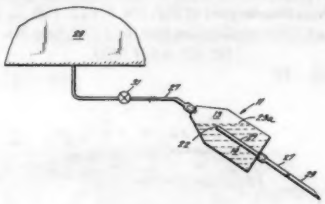
**3,744,492**
**DRIP CHAMBER**

**Saul Leibinsohn, 11 Hagardom St., Rishon Lezion, Israel**

**Filed Apr. 7, 1971, Ser. No. 132,789**
**Int. Cl. A61m** *05/16*
**U.S. Cl. 128—214 C** **3 Claims**



A drip chamber for use in an infusion set for feeding blood, saline solution or other liquids from a container to a catheter or needle for administration to a patient. The drip chamber comprises an inlet section and a larger volume outlet section, liquid filling the latter section before it can escape from the chamber outlet and, when in use, covering the outlet irrespective of the orientation of the drip chamber, such that air bubbles can not escape from the drip chamber to the catheter or needle of the infusion set and thence to the patient.

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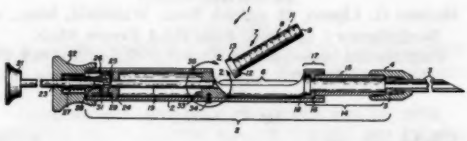
**3,744,493**
**IMPLANTER HAVING AN IMPROVED CARTRIDGE EJECTOR**

**Keith E. Booher, Ennis, Mont., and George M. Van Loozen, Soquel, Calif., assignors to Syntex Corporation, Panama, Republic of Panama**

**Filed Jan. 10, 1972, Ser. No. 216,559**
**Int. Cl. A61m** *5/00*
**U.S. Cl. 128—217** **6 Claims**



A pellet implanter includes a tubular body having a movable plunger therein extending from the rear end thereof through a hollow needle at the forward end thereof for pushing pellets from a pellet cartridge through the cartridge and through the

hollow needle into the animal being treated. A side breech opening is provided in the body of the implanter. A cartridge ejector and stripper is provided proximate the rear end of the breech opening. The cartridge stripper and ejector includes a plug having a central bore for retaining the plunger therein against transverse translation. A forwardly projecting eccentric end portion of the ejector and stripper plug engages the rearwardly moving cartridge for stripping the cartridge from the plunger and for flipping the spent cartridge through the side breech opening, thereby ejecting same.

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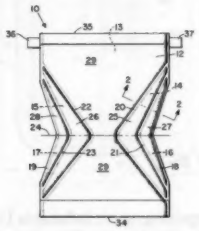
**3,744,494**

**DISPOSABLE DIAPER WITH IMPROVED CONTAINMENT CHARACTERISTICS**

**Mario S. Marsan, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed July 10, 1970, Ser. No. 53,762**
**Int. Cl. A61f *13/16***
**U.S. Cl. 128—287** **15 Claims**



A disposable diaper construction includes a water impervious plastic backing sheet and, preferably, a hydrophobic, moisture-permeable topsheet. An absorbent pad or core is interposed between the backing sheet and the topsheet. Discontinuities in the absorbent core provide lines of isolation between several adjacent but separated core portions. The topsheet and backing sheet are continuous in the relatively narrow areas which form the lines of isolation. The fold lines of the diaper preferably coincide with the lines of isolation. This structure results in improved fluid containment as the lines of isolation between the adjoining core portions provide a barrier to sidewise fluid flow such that liquids tend to flow lengthwise of the diaper. In a preferred configuration, the diaper has excellent fitting characteristics in relation to the contours of the body of the infant, particularly around the legs, and this results in further efficiencies from the standpoint of fluid containment.

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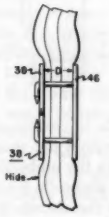
**3,744,495**

**METHOD OF SECURING PROLAPSED VAGINA IN CATTLE**

**Mark S. Johnson, Holden, Utah**

**Continuation-in-part of Ser. No. 268, Jan. 2, 1970, Pat. No. 3,598,299. This application July 19, 1971, Ser. No. 163,926**
**Int. Cl. A61b *17/04, 17/08***
**U.S. Cl. 128—337** **1 Claim**



This is a method of and means for securing a prolapsed vagina in cattle. The means used takes the form of a novel staple which, by means of a pliers-type instrument, can be inserted internally and thrust through affected muscle and tissue to accommodate securement to an accompanying retention plate deposited externally to the animal. Both the staple head and plate are enlarged relative to the prongs used in the design. The method contemplates the use of such means to secure the prolapsed vagina to the interior, proximate muscle area such that a desired condition may be effected and preserved.

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**3,744,496**

**CARBON FILLED WRAPPER FOR SMOKING ARTICLE**

**Stuart W. McCarty, Brevard; Donald T. Owen, Hendersonville, and William F. Owens, Jr., Pisgah Forest, all of N.C., assignors to Olin Corporation, Pisgah Forest, N.C.**

**Filed Nov. 24, 1971, Ser. No. 201,837**
**Int. Cl. A24d *1/02***
**U.S. Cl. 131—8** **10 Claims**

A carbon filled wrapper for smoking articles such as cigarettes, cigars and the like which significantly reduces the total particulate matter yield and organic vapor phase constituents in the mainstream smoke therefrom while simultaneously reducing the visible sidestream smoke. The carbon filled wrapper is preferably used as an inner wrapper for the tobacco column in combination with an outer wrapping of conventional cigarette paper or cigar wrap. The carbon content of the wrapper may vary over a wide range depending upon the effect desired. Various types of carbon, either activated or unactivated, may be used. Increased effects may be obtained if calcium carbonate is incorporated in the carbon filled sheet and the effects are further enhanced if the paper is treated with an oxidation catalyst such as the alkali metal hydroxides, bicarbonates and carbonates. The paper is also particularly suited as a means for introducing various flavorants to the cigarette since the carbon holds the flavor until released by the heat of the burning zone.

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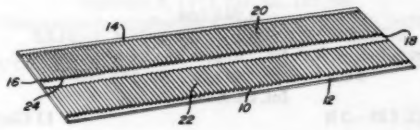
**3,744,497**

**CIGARETTE FILTER**

**Frank Marciuliano, Dix Hills, N.Y., assignor to Ivy Graphics & Planning, Inc., New Canaan, Conn., a part interest**

**Filed Sept. 25, 1970, Ser. No. 75,331**
**Int. Cl. A24d *01/04***
**U.S. Cl. 131—261 B** **1 Claim**



A cigarette filter formed from an aluminum foil base carrier with a first corrugated strip made of charcoal impregnated filter paper attached to the base. A second strip of corrugated filter paper is attached to the base in parallel spaced relation to the charcoal impregnated strip. The base is rolled into a spiral thereby causing the filter strips to roll along with it. A resultant tubular filter member is produced having an axial air gap between the outwardly disposed plain filter strip and the inwardly disposed charcoal impregnated filter strip.

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**3,744,498**

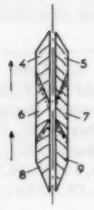
**METHOD OF FORMING A CONTINUOUS BAND OF NATURAL TOBACCO**

**Pierre Imbert, Fleury-les-Aubrais, France, assignor to Service d'Exploitation Industrielle de Tabacs, Paris, France**

**Filed Mar. 11, 1971, Ser. No. 123,171**
**Int. Cl. A24b *03/16***
**U.S. Cl. 131—149** **5 Claims**

Method of forming a continuous band of natural tobacco, primarily with a view to forming cigar wrappers to be cut from

said band by cutting from tobacco leaves fragments of polygonal shape and joining said fragments together comprising the steps of constituting at least one series of leaves in which the leaves are oriented in the same direction and the leaf ribs are raised on the same side of a plane, then cutting on each side of the midribs of said leaves trapezoidal fragments



having the same height, removing the leaf fragments which project from the trapezoidal shape, then displacing the two half-leaves of one leaf in such a manner as to ensure that the long bases thereof are aligned with the short bases of the two half-leaves of an adjacent leaf and finally joining together along the non-parallel sides of the trapezoid the successive half-leaves which have thus been aligned.

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**3,744,499**

**DENTAL FLOSS ROLL COMPRISING INTERCONNECTED PIECES EACH HAVING A PICK END**

**Richard L. Wells, 4503 N. 32nd St., Phoenix, Ariz.**

**Filed Oct. 30, 1972, Ser. No. 301,963**
**Int. Cl. A61c *15/00***
**U.S. Cl. 132—92 A** **17 Claims**

Dental floss roll comprising interconnected pieces, each with a pick end having a degree of rigidity greater than the floss.

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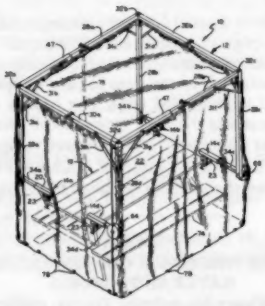
**3,744,500**

**SCREEN ENCLOSURE FOR PICNIC TABLES**

**Robert S. Briggs, R.D. No. 2 Rogers Road, Port Crane, N.Y.**

**Filed Dec. 20, 1971, Ser. No. 209,703**
**Int. Cl. A45f *1/00***
**U.S. Cl. 135—3 R** **11 Claims**



A foldable, portable, light-weight, screen enclosure for picnic tables adjustable to fit tables of various lengths and widths. The enclosure framework has corner uprights with horizontally extending arms at their lower ends slidably receivable in horizontal tubular sockets in respective attachment members releasably clamped to the table corners. Horizontal members interconnecting the upper ends of the uprights are hinged at their respective ends and midpoints, permitting the framework structure to fold into a compact bundle of parallel frame elements.

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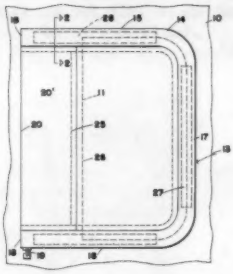
**3,744,501**

**TENT DOOR CONSTRUCTION**

**Albert Kozarsky, 710 Hoskins Avenue, Winnipeg, Manitoba, Canada**

**Filed Feb. 12, 1971, Ser. No. 114,877**
**Int. Cl. A45f *1/08***
**U.S. Cl. 135—14 D** **8 Claims**



A tent door comprising an air inflatable U-tube frame with a fabric web spanning the U-tube. The air in the tube normally urges the door closed with the U-tube legs straight. When the door is open, the legs of the U-tube bend and compress the air slightly thus causing the door to close when released assisted by a stretched rubber strip in each leg adhesively secured to the inner walls and spanning the hinge line.

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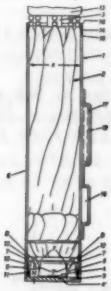
**3,744,502**

**UMBRELLA AND SHEATH**

**Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Quebec, Canada**

**Filed Jan. 7, 1972, Ser. No. 216,082**
**Claims priority, application Germany, Jan. 9, 1971, P 21 00 894.6; Jan. 9, 1971, P 71 00 678.5**
**Int. Cl. A45b *25/24***
**U.S. Cl. 135—20** **10 Claims**



A collapsible umbrella in combination with a rigid walled sheath, a resilient clip within the sheath adapted to grip one end of the umbrella when the umbrella is collapsed and in the sheath. The stick of the umbrella is telescopic and the retaining force of the clip in the sheath is greater than the force necessary to fully extend the telescopic stick when the stick is pulled from its other end.

The sheath has loops fixed to the rigid walls of the sheath for passing a belt therethrough.

3,744,503

## GARDEN UMBRELLA

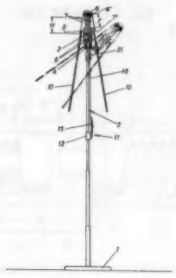
Joachim Wolff, Hilden; Josef Schaefer, Solingen, both of Germany, assignors to Telesco Brophey Limited, Quebec, Canada

Filed Oct. 14, 1971, Ser. No. 189,149

Claims priority, application Germany, Oct. 1, 1971, P 21 49 231.9; Oct. 1, 1971, P 21 49 077.7; Oct. 1, 1971, P 21 49 076.6; Oct. 4, 1971, P 21 49 420.2; Oct. 8, 1971, P 21 50 198.4

Int. Cl. A45b *17/00*

U.S. Cl. 135—20 M 43 Claims



An umbrella used as a garden or beach umbrella which has a self-supporting base and a stick. A crown is fixed to a sliding stick section which is adapted to slide within the supporting stick, dome ribs are pivoted to the crown, a runner is fixed to the supporting stick and struts are pivoted to the runners and the dome ribs. A flexible cable is connected at one end to the crown and at the other end to a lever which pivots about a fixed axis on the supporting stick through a dead center such that when the lever is in an unlocked or upward position, the weight of the dome ribs causes the crown and stick section fixed to the crown to be extended to its fullest length such that the dome ribs are in a closed position, and when the lever is pivoted past the dead center position, a flexible cable pulls the crown and stick section fixed to the crown downwardly against the weight of the dome ribs to bring the umbrella into an umbrella open position.

The supporting stick is hinged for possibly pivoting the umbrella to a position at an angle from the vertical such as in known beach umbrellas, and a sleeve slidable on the supporting umbrella stick is adapted to fit over the hinge point of the umbrella stick to retain the umbrella in a vertical position or when it is removed from the hinge location, to provide a guide for the flexible cable when the umbrella is at an angle to the vertical.

The dome ribs may be made up of sections with the outer section fixed into an inner section which is pivoted to the crown and to the strut, while the outer section is movable relative to the inner section and urged to its fullest extent by means of springs between the outer section and the inner section.

The inner section of the dome rib and the support strut could be made of plastic material integral with the crown and the fixed runner respectively, but with a plurality of lateral slits provied at the hinge point so as to permit the inner dome rib section and the strut to pivot as necessary about the axis at the portion of these members which are provided with the slits.

The operating lever could be provided for movement in guide slots which are parallel to the umbrella stick to a final position where the lever can be rotated past a dead center position.

3,744,504

## SHORTENABLE UMBRELLA

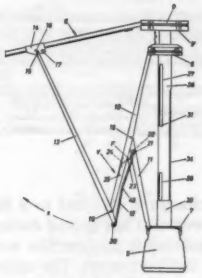
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Quebec, Canada

Filed Dec. 28, 1971, Ser. No. 212,940

Claims priority, application Germany, Jan. 9, 1971, P 21 00 912.1

Int. Cl. A45b *19/06*

U.S. Cl. 135—26 10 Claims



A three-stage umbrella of the telescopic type in which all of the dome rib support members nest one within the other to form a compact umbrella of small outer dimensions when folded and the support members form a quadrilateral structure which is provided with spring means to urge the quadrilateral structure open when the dome ribs are closed to give the support members an initial opening pivoting movement when it is required to open the umbrella.

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3,744,505

## SAFETY PIPING FOR FLUID CONVEYANCE

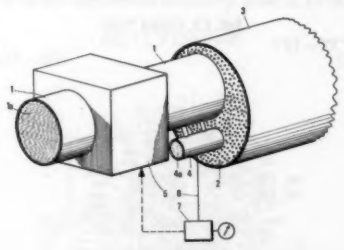
Michel Huvey, Bougival, and Germain Le Meur, Stains, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison and Societe Anonyme Pour Tous Appareillages Mecaniques (S.A.T.A.M.), LaCourneuve, both of France

Filed Oct. 8, 1971, Ser. No. 187,786

Claims priority, application France, Oct. 15, 1970, 7037353

Int. Cl. F16l *55/16*

U.S. Cl. 137—68 5 Claims



Safety piping for fluid conveyance comprising, in association with a main fluid conveying pipe, an auxiliary safety pipe containing an auxiliary fluid, separate from the main pipe but in the vicinity thereof and adapted to be broken when the assembly of both pipes is subjected to excessive stresses and in any case when the main pipe breaks, and a safety manometric device adapted to stop the feeding of the main pipe with fluid to be conveyed in response to a decrease of the auxiliary fluid pressure.

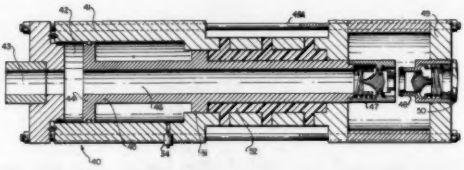
## 3,744,506
## THERMAL SENSING ACTUATING DEVICE

James L. Milsted, Sr., Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 32,845, April 29, 1970, Pat. No. 3,651,823. This application Feb. 22, 1972, Ser. No. 228,098

Int. Cl. F16k 17/38; E21b 33/06

U.S. Cl. 137—72 10 Claims



The present disclosure is directed to a fail safe device to close an oil or gas well that has ignited during drilling or workover operations working in conjunction with pressure accumulators and blow out preventers. The apparatus is installed in a line the upstream side of which is pressurized by the accumulators and the downstream side of which is connected to actuate the blow out preventer. The device has a pair of normally closed check valves which are spaced apart but which may be moved together to mate and unseat the valves and permit the pressurized fluid from the accumulators to actuate the blow out preventer. The movement of the check valves is caused by a fluid motor which while being under pressure is restrained from unseating the valves by a barrier of a material which is normally solid, but when attaining high temperature due to the fire will flow to permit the fluid motor to cause the normally closed check valves to mate and unseat and thereby apply the accumulator pressure to actuate the blow out preventer to close the well.

## 3,744,507
## SWITCHOVER VALVE FOR PNEUMATIC INSTALLATIONS

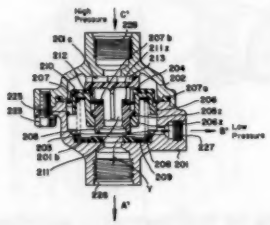
Heinrich Oberthur, Offenbach-Rumpenheim, Germany, assignor to Alfred Teves GmbH, Frankfurt Main, Germany

Division of Ser. No. 873,746, Nov. 26, 1969, Pat. No. 3,613,710, and a continuation of Ser. No. 668,462, Sept. 18, 1967, abandoned. This application July 21, 1971, Ser. No. 164,581

Claims priority, application Germany, Sept. 22, 1966, T 32107

Int. Cl. G05d 7/00

U.S. Cl. 137—107 7 Claims



A fluid-operated switchover valve having an outlet communicating with a gas chamber (e.g. of a charging cylinder for a hydrodynamic brake system), a first inlet communicating with a source of gas (e.g. an air-pressure tank or the atmosphere) and another control inlet subjected to reduced pressure (e.g. from a suction reservoir), the valve having a housing forming an elongated bore for a valve piston bearing against a spring with the pressure of the first inlet and a valve member slidable in the piston and co-operating therewith to form a valve which alternatively connects the suction inlet and the air inlet with the chamber.

## 3,744,508
## PRESSURE-REGULATING VALVE, PARTICULARLY FOR FUEL-OIL PUMPS

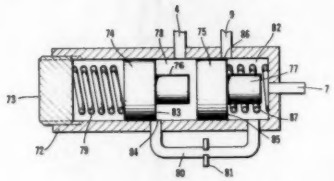
Gunnar Lyshoj Hansen, and Jorgen Hartvig Petersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordberg, Denmark

Filed Aug. 5, 1969, Ser. No. 847,638

Claims priority, application Germany, Aug. 3, 1968, P 17 73 985.4

Int. Cl. G05d 7/01

U.S. Cl. 137—116.3 21 Claims



The invention relates to a pressure regulating valve assembly for pumps. The assembly includes two relatively movable pistons with one being a setting piston acted upon by supply pressure and a rated spring and the other being a regulating piston which controls a return orifice and is acted upon by the supply pressure and a differential spring. The supply pressure for the regulating piston is delivered through a modulated restrictor passage with the pressure drop in the restrictor passage corresponding to the quantity of pressurized fluid delivered therethrough. The regulating piston is hydraulically loaded by only a differential pressure which provides a greater ease in movement and allows a relatively weak differential spring to be utilized.

## 3,744,509
## THREE WAY FLOW REGULATING VALVES

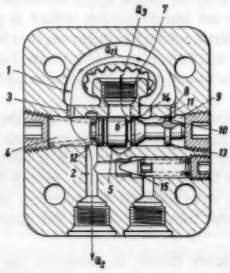
Heinz Teubler, Bad Homburg, and Otto Langosch, Usingen both of Germany, assignors to Vickers GmbH, Hamburg, Germany

Continuation of Ser. No. 4,719, Jan. 21, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 194,595

Claims priority, application Germany, Jan. 23, 1969, P 19 03 305.7

Int. Cl. F16k 31/12

U.S. Cl. 137—117 1 Claim



A flow regulating valve comprises a control piston arranged to be impinged on both ends by a flow and further piston

means, connected with the piston and arranged to be acted upon by the flow substantially statically so that the force on the second piston substantially represents the static flow pressure.

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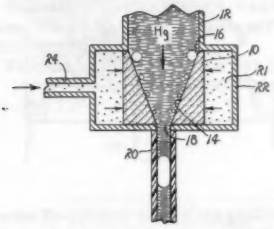
**3,744,510**

## INJECTOR FOR USE IN HIGH-VOLTAGE ISOLATORS FOR LIQUID FEED LINES

**James C. Fletcher, Administrator of the National Aeronautics and Space Administration in respect to an invention of, and John A. Snyder, Woodland Hills, Calif.**

**Filed Oct. 7, 1971, Ser. No. 187,262**
**Int. Cl. F17d *3/00***
**U.S. Cl. 137—154** **1 Claim**



An improved injector for use in introducing fluid substances into feed lines employed in delivering flowing bodies of liquids. The injector includes a porous plug, concentrically related to a feed line, including an internally tapered surface of a truncated conical configuration having an inlet orifice of a first diameter and a discharge orifice of a second diameter substantially smaller than the first diameter and an external surface circumscribed by an annular chamber containing a body of insulating gas.

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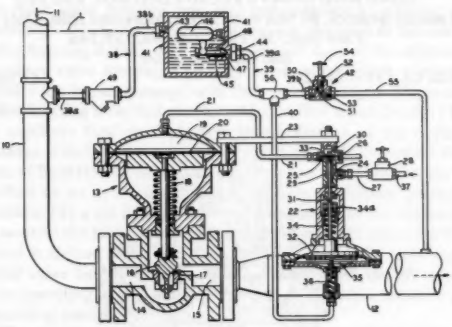
**3,744,511**

## CONDENSATE HANDLING SYSTEM

**Jay P. AuWerter, Shaker Heights, Ohio, assignor to The C. E. Squires Company, Cleveland, Ohio**

**Filed June 4, 1971, Ser. No. 150,154**
**Int. Cl. F16t *1/20***
**U.S. Cl. 137—195** **4 Claims**



A system is provided for disposing of condensate accumulating as a result of operation of space heating or cooling processes and apparatus. The system includes a conduit in which condensate accumulates, and a fluid pressure operated discharge valve which is modulated between open and closed conditions to maintain a predetermined level of condensate in the conduit. Modulation of the discharge valve is controlled by a fluid pressure operated pilot valve which is actuated to control flow of operating fluid to the discharge valve. The pilot valve is actuated in response to the level of condensate in the accumulator conduit and the control fluid pressure signal for actuating the pilot valve is flashed condensate under pressure from the accumulator conduit and/or head pressure of condensate in the system. Delivery of condensate and flashed condensate from the accumulator conduit for actuating the pilot valve is controlled by means responsive to the level of condensate in the accumulator conduit, and the magnitude of the pressure signal is controlled by flow restricting means together with the level responsive means.

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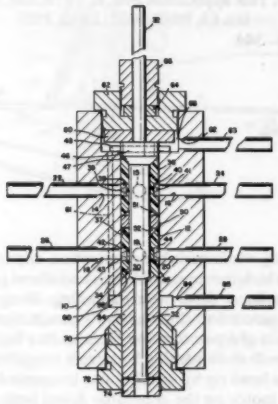
**3,744,512**

## VALVE APPARATUS

**Roger O. Billman, 104 Warren St., Martinez, Calif.**

**Filed July 2, 1970, Ser. No. 52,008**
**Int. Cl. F16k *5/04, 49/00, 51/00***
**U.S. Cl. 137—238** **10 Claims**



A valve useful over a wide temperature range and having a purge system which prevents leaks from the valve and a valve stem especially useful with a valve having such a purge system which valve stem has easily replaceable sleeves having porous support means in the openings thereof for use in the operational portion of the valve body to control flow therethrough.

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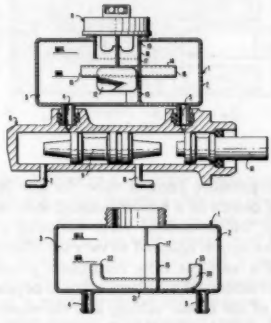
**3,744,513**

## BRAKE FLUID TANK FOR A HYDRAULIC BRAKE SYSTEM

**Lothar Leitenberger, Kornwestheim, Germany, assignor to Daimler-Benz AG, Kornwestheim, Germany**

**Filed June 4, 1971, Ser. No. 150,066**
**Claims priority, application Germany, June 5, 1970, P 20 27 712.7**
**Int. Cl. F15b *7/08***
**U.S. Cl. 137—255** **22 Claims**



A supply reservoir for brake fluids of a hydraulic brake system, especially for vehicles, which includes at least two

chambers and in which two adjacent chambers are connected by way of a pipe whose discharge openings are arranged approximately at the height of the minimum permissive fluid level in the chambers and at such a distance from the partition wall that the discharge opening projects out of the fluid level in case of an inclination of the fluid level which would be present within the chamber when the minimum permissive fluid level is reached.

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**3,744,514**

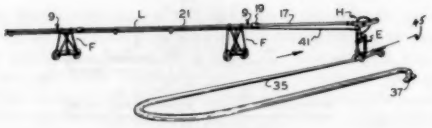
## AXLE DRIVEN TRAVELING-WHILE-SPRINKLING IRRIGATION APPARATUS

**Robert R. Stafford, Route 7, Box 1770, Eugene, Oreg.**

**Continuation of Ser. No. 87,302, Nov. 5, 1970, abandoned, which is a continuation of Ser. No. 749,087, July 31, 1968, abandoned. This application Feb. 8, 1972, Ser. No. 224,510**

**Int. Cl. B05b** *9/02;* **E01h** *3/02*

**U.S. Cl. 137—344** **8 Claims**




A travelling-while-sprinkling irrigation apparatus having a lateral line which is supported by spaced wheel pairs, the latter being driven by a drive axle extending along the line and drivingly connected to the wheels by mechanisms which permit the wheels of a pair to move, at least to a limited extent, at different speeds as demanded by terrain irregularities. The apparatus has a head rig by which water is supplied to the line. A single water motor on the apparatus drives both the drive axle and the head rig, and means are provided for regulating the speed of the lateral line and the head rig so that the two will move at the same overall rate across a plot of ground.

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**3,744,515**

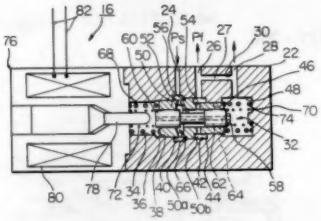
## HYDRAULIC PRESSURE CONTROL VALVE FOR POWER-ASSISTED STEERING SYSTEM

**Naohiko Inoue, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan**

**Filed June 29, 1972, Ser. No. 267,377**

**Int. Cl. B62d** *5/08*

**U.S. Cl. 137—494** **2 Claims**




A hydraulic pressure control valve for use in a hydraulic-power control device of a power-assisted steering system of a motor vehicle, which control valve includes a primary and secondary valve spools adapted to vary the effective cross sectional area of a variable flow restriction provided between inlet and outlet sides of the control valve in dependence on the driving speed of the motor vehicle and the steering resistance of the motor vehicle for thereby maintaining a steering-assistance hydraulic pressure to be delivered to a hydraulic reaction chamber at an appropriate value for effecting easy and reliable steering operation of the motor vehicle during various driving conditions of the motor vehicle.

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**3,744,516**

## COMBINED FILLING DEVICE AND VENT CUT-OFF VALVE FOR ELECTRIC STORAGE CELLS

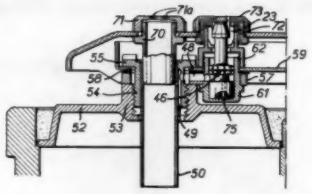
**Robert Arnold Rowe, 17 Rue Chasseloup-Laubat, Paris (15 eme), France**

**Filed Feb. 26, 1971, Ser. No. 119,225**

**Claims priority, application France, Mar. 4, 1970, 7007772**

**Int. Cl. H01m** *1/06*

**U.S. Cl. 137—587** **11 Claims**




A combined filling device and vent cut-off valve for an electric storage cell having a tank with an electrolyte which is adapted to be replenished by distilled water. A stopper mounted on a cover plate is provided for closing the filling hole. The vent cut-off valve is effectively arranged between the space above the electrolyte in the tank and a vent provided in a cover plate and includes a valve member having a piston slidably mounted in a cylinder with a port and operative connected to the cover plate. When the stopper is in position in the filling hole, the valve member is in an open position in which the gas in the space above the electrolyte can escape to the atmosphere via the vent and when the stopper is removed from the filling hole the valve member is automatically closed to prevent the escape of gas to the atmosphere. The device can be mounted on the filling hole of any conventional battery by threaded bushings. The device is adapted for multi-compartment storage cells in which case the cover plate supports each stopper and is operatively connected to each cut-off valve.

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**3,744,517**

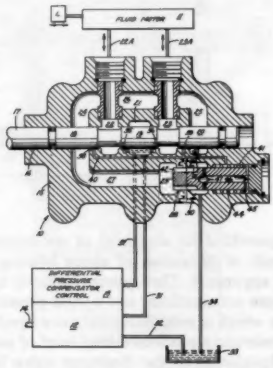
## LOAD RESPONSIVE FLUID CONTROL VALVES

**Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio**

**Filed Sept. 30, 1971, Ser. No. 185,146**

**Int. Cl. F16k** *11/00*

**U.S. Cl. 137—596.2** **14 Claims**




A direction and flow control valve for use in a central fluid power load responsive system having plurality of loads. The

valve maintains a selected constant flow level for control of both positive and negative loads, irrespective of the change in the load magnitude or change in the fluid pressure, supplied to the valve. System is powered by a single variable volume pump equipped with a load responsive control, which automatically maintains pump discharge pressure at a level higher than the pressure required by the system's largest load. Each direction and flow control valve is equipped with a differential pressure regulating control, which is responsive to the load pressure for controlling the negative loads and preferably a second differential pressure regulating control for controlling the positive loads.

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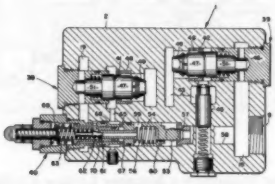
**3,744,518**

## DIRECTIONAL CONTROL VALVE

**Hugh J. Stacey, Willoughby, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio**

**Filed Dec. 13, 1971, Ser. No. 207,268**
**Int. Cl. F16k *11/00***
**U.S. Cl. 137—596.12** **13 Claims**



A multi-spool directional control valve for controlling the operation of the lift, mast tilt, and auxiliary cylinders of a lift truck or the like characterized in the provision of a main valve housing having therein the spools for controlling the actuation of the lift and mast tilt cylinders, and having clamped thereto by a cap member the housings of one or more auxiliary spool valves for controlling the actuation of, for example, a load rotating cylinder and/or a load clamping cylinder. Said auxiliary spool valve housings have bypass and return passages registering with each other and with corresponding passages of the main valve housing, and said cap member by which said auxiliary valve housing (or housings) are clamped to the main valve housing defines with the juxtaposed face of the adjacent auxiliary valve housing a passage or chamber which communicates the bypass passage with the return passages. The main valve housing is further characterized in that it has therein (1) an auxiliary flow control valve in the portion of the bypass passage which is between the lift and tilt spools to control the rate of fluid flow to an auxiliary valve when the spool therein is shifted to an operating position blocking its bypass passage portion; (2) a tilt flow control valve upstream of the tilt spool to control the rate of fluid flow to the tilt cylinder when the tilt spool is shifted to an operating position; and (3) a two-stage relief valve having a higher relief pressure when the lift spool is in operating position than when one of the other spools is in operating position.

The directional control valve herein is further characterized in that the auxiliary valves are compact, not only in stack height, but in length as well and are otherwise of simple construction with load check valves embodied within the hollow spools thereof.

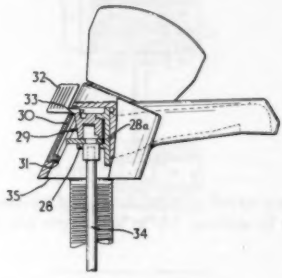
Yet another characterizing feature of this invention is that each spool thereof has associated therewith a switch which energizes the pump drive motor when the spool is shifted to an operating position, the pump drive motor being started without load upon initial movement of the spool toward operating position while the bypass passage through the valve assembly is yet open.

**3,744,519**

## MIXER TAPS

**Bernard Arthur Parsons, Walsall, England, assignor to IMI Developments Limited, Birmingham, England**

**Filed July 26, 1971, Ser. No. 165,935**
**Claims priority, application Great Britain, July 28, 1970, 36,506/70; June 17, 1971, 28,466/71**
**Int. Cl. F16k *19/00***
**U.S. Cl. 137—606** **7 Claims**




A mixer tap in which the body has a chamber at the rear of the body and which is separate from water passageways passing through the body, the chamber being provided to receive a support element of a plug actuating mechanism and having an opening to the outside of the body for the insertion of the support element.

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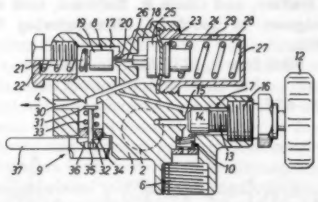
**3,744,520**

## VALVE ARRANGEMENT FOR DIVING EQUIPMENT

**Hans Otto Lerris, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Mar. 25, 1971, Ser. No. 128,048**
**Claims priority, application Germany, Apr. 16, 1970, P 20 18 146.8**
**Int. Cl. F16k *17/04***
**U.S. Cl. 137—612.1** **1 Claim**

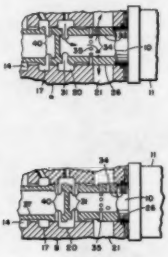



The invention relates to a valve for diving equipment which comprises a valve housing having a charging port, a bottle port and an outlet port. Reducing valve means and reserve valve means are provided in series in the main fluid flow path. The reserve valve means remains open until a pressure on the downstream side thereof has dropped to a point where air in the bottle is at a predetermined low pressure, at which time the reserve valve closes. The reserve valve has means associated therewith which are manually operable to open the reserve valve to allow the remaining contents of the bottle to be fully utilized.

## 3,744,521
## DIRECTIONAL CONTROL VALVE

John C. Paul, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 13, 1971, Ser. No. 207,267
Int. Cl. F16k 11/00
U.S. Cl. 137—625.68 8 Claims



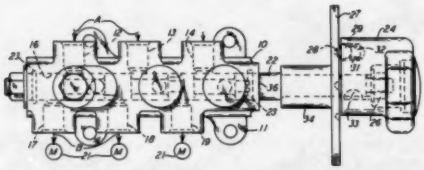
A four-way spool type valve assembly for controlling for example the boom actuating motor of a front end loader and the like characterized in that, when the spool is in power lower position, the return fluid from the motor is conducted to the return passage via a passage in one end portion of the spool and a restricted orifice which opens into the return passage. The valve assembly herein is further characterized in that, when the spool is in float position beyond the power lower position, the passage in said one end portion thereof yet communicates with the adjacent motor passage while additional passages axially adjacent the restricted orifice open into the return passage and in addition a passage in the other end portion of the spool intercommunicates both motor passages so that the boom may partake of rapid upward and downward float.

A further characterizing feature of the valve assembly herein is that there is a make-up check valve to prevent motor cavitation as during rapid floating movements of the boom.

## 3,744,522
## MULTIPLE OUTLET SPOOL VALVE

Donald G. Haffner, and Glenn R. Hubbard, both of Racine, Wis., assignors to Jacobson Manufacturing Company, Racine, Wis.

Filed June 7, 1972, Ser. No. 260,464
Int. Cl. F16k 3/26, 11/07
U.S. Cl. 137—625.17 7 Claims

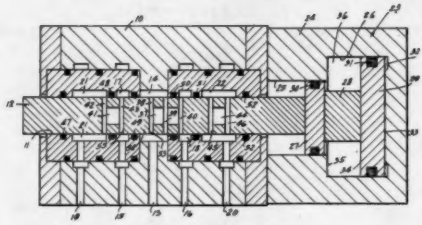


A multiple outlet spool valve having a valve housing with a plurality of fluid inlets and fluid outlets and an intermediate chamber. A spool is axially and rotatably movably disposed within the chamber and has sealing portions for selectively blocking flow to the outlets. Fluid passageways are provided in the spool sealing portions, and additional fluid outlets are in the housing for fluid-flow communicating with the spool fluid passageways such that fluid can be selectively directed to the additional fluid outlets through the fluid passageways and thereby returned to the tank or reservoir. A handle is connected to the spool for the axial and rotatable movement of the spool, and the spool and the outlets are arranged such that axial movement of the spool blocks fluid flow to all the outlets, and rotational movement of the spool permits the fluid to bypass to selective ones of the additional said outlets to return fluid to the tank.

## 3,744,523
## FLUID PILOT VALVE

James C. Hill, 174 N. Euclid, Oak Park, Ill.

Filed July 21, 1971, Ser. No. 164,664
Int. Cl. F16k 11/06
U.S. Cl. 137—625.68 1 Claim

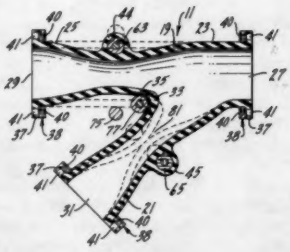


A spool valve including a housing having a cylindrical bore in which is carried a slidably mounted piston. Means are provided to move the piston back and forth within the cylinder to carry on the valve action. The housing has a supply inlet, a pair of work outlets and a pair of exhaust outlets symmetrically disposed about the supply inlet. The slidable piston has openings formed therein to provide communication links between the various inlets and outlets when the piston is properly aligned with such inlets and outlets. The housing has O rings positioned in recesses formed in the wall of the cylindrical bore, and the piston makes a sealing engagement with the O rings. The spacing between the openings in the piston and the spacing between the various inlets and outlets is dimensioned in such a way that the sliding action of the piston does not suddenly introduce a relatively high pressure against one of the O rings prior to the time when the O ring is covered and hence held in place by a solid portion of the piston.

## 3,744,524
## FLEXIBLE PINCH VALVE FOR CONVEYING DRY MATERIALS AND SLURRIES

Robert E. Blau, 791 Rosewood Avenue, Winnetka, Ill.

Filed Sept. 8, 1970, Ser. No. 70,373
Int. Cl. F16k 7/06, 11/14
U.S. Cl. 137—636 4 Claims



A molded, one piece, generally Y-shaped, flexible, tubular valve body formed of a fabric reinforced elastomer. The valve

body is mounted in a housing which also supports a roller type pinching mechanism to open and close the legs of the Y-shaped valve body. A nose portion is formed as part of the valve body at the juncture of the legs of the valve body and moves in the direction of the leg being pinched closed. The nose portion is reinforced by a stiff arcuate shaped insert. The configuration of the valve body and its mounting on the housing permits flexing of the portion of the valve body upstream of the nose portion during opening and closing of the leg portions of the valve body. This construction permits the pinching elements to be positioned close to the juncture of the legs of the Y-shaped valve body, thus reducing the volume of the plug of material that is trapped in the branch leg upon closing thereof.

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**3,744,525**

**MOMENTUM-INTERACTION TYPE FLUIDIC DEVICES**

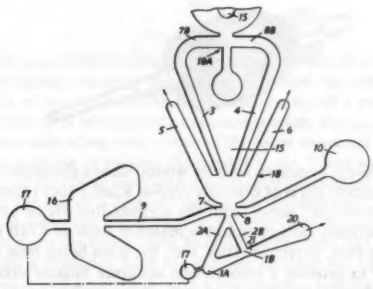
**Guy Edward Davies, Fareham, England, assignor to The Plessey Company Limited, Ilford, England**

**Filed Sept. 2, 1970, Ser. No. 68,965**

**Claims priority, application Great Britain, Sept. 10, 1969, 44,707/69**

**Int. Cl. F15c *1/14***

**U.S. Cl. 137—823** **2 Claims**



In order to permit a fluidic amplifier of the momentum-interaction type to receive, in addition to its main control by a pair of transverse control jets, a secondary control input, its power input is arranged in the form of two jet nozzles 2A and 2B respectively aligned with the output branches at the two sides of a splitter wedge 15, thus permitting a pressure difference representing the secondary control input to be applied between the two power-input branches 1A and 1B.

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**3,744,526**

**RESERVE AND FILL VALVE FOR SELF-CONTAINED UNDERWATER BREATHING APPARATUS**

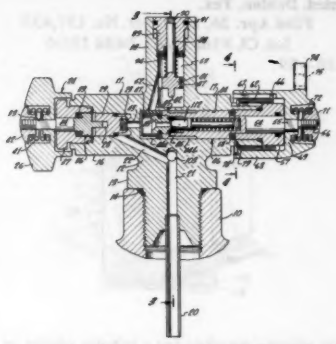
**Douglas K. MacNiel, Costa Mesa, Calif., assignor to U. S. Divers Co., Santa Ana, Calif.**

**Filed Mar. 24, 1971, Ser. No. 127,564**

**Int. Cl. A62b *9/02***

**U.S. Cl. 137—599.2** **9 Claims**

A fully-automatic reserve and fill valve for scuba gear, comprising a reserve valve which is manually movable to a "reserve" position permitting the diver to use all of his reserve air, a torsion spring which constantly biases the reserve valve away from the "reserve" position to thereby prevent accidental usage of reserve air, and a spring-biased plunger responsive to pressure in the air tank and adapted to maintain the reserve valve in the "reserve" position when and only when the tank pressure is below a predetermined level. A spring-biased poppet moves back and forth in response to the breathing of the diver, and seats on a movable seat when the tank pressure is near the reserve level to thereby inform the diver that he should manually shift the reserve valve to "reserve" position. The movable poppet seat is maintained in operative position relative to the poppet during the entire dive, and is automatically shifted away from such operative position while the tank



is filled, thus permitting the tank filling to occur in a fully automatic manner and regardless of the position of the reserve valve.

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**3,744,527**

**PULSE DAMPER UNIT FOR HYDRAULIC SYSTEM**

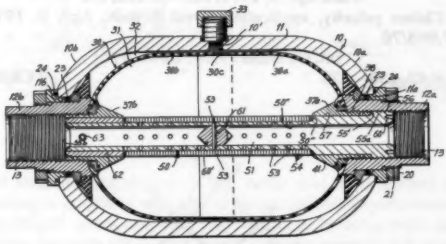
**Jacques H. Mercier, 49 rue de Naples, Paris, France**

**Filed July 13, 1972, Ser. No. 271,602**

**Claims priority, application France, Aug. 13, 1971, 7129676**

**Int. Cl. F16l *55/04***

**U.S. Cl. 138—30** **11 Claims**



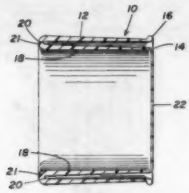
The present invention relates to a pulse damper unit for a hydraulic system and comprises a rigid container with two opposed ports, each having an associated tubular fitting defining an inlet and outlet respectively for connection of the unit to the hydraulic system. A flexible separator in the form of a bladder having two opposed ports, is positioned in the container defining an inner and outer chamber with said bladder ports being associated with and operatively connected to said fittings. A tube extending axially in said container, has its ends operatively connected to said tubular fittings, one end of said tube being rigidly secured to an associated fitting and the other end of the tube being slidably mounted with respect to an associated fitting. The tube defines a longitudinal passageway connecting said tubular fittings and has a permeable wall providing communication between said passageway and said inner chamber, a baffle adjustably mounted in said tube insuring that all of the hydraulic fluid entering the inlet fitting will flow through said permeable wall into said inner chamber before discharge from said outlet fitting. A third fitting is connected to a port leading into said container and in communication with said outer chamber, for charging of said outer chamber with fluid under pressure in order to dampen pulses in the hydraulic system.

**3,744,528**

## TUBE CLOSURE MEMBER

George W. Vestal, Denton, Tex., assignor to S & V Plastics Incorporated, Denton, Tex.

Filed Apr. 26, 1971, Ser. No. 137,433
Int. Cl. F16l *55/10*; B65d *59/06*
U.S. Cl. 138—89 8 Claims




A plastic closure member for a tubular object or a tubular opening which includes an outer lip for fitting snugly over an outside end of a tube, integral with an inner section which extends within the interior of the tubular opening and comprises generally continuous sidewalls enclosing an end section. The lip and the inner section are joined together by a seating section for receiving the end of the tube. The sidewalls of the inner section are sufficiently flexible to allow inversion of the end section in response to pressure within the tube and consequent folding of the sidewalls.

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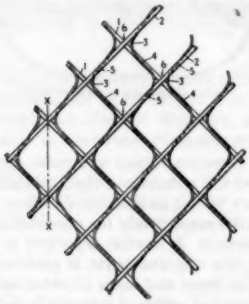
**3,744,529**

## EXTRUDED PLASTICS NETTING

Jose Mas Jorda; Jacinto Fort Farre, and Francisco Gutierrez Espinosa, all of Cardedeu (Barcelona), Spain, assignors to Netlon (P.T.A.) Limited, Lancashire, England

Filed Apr. 8, 1971, Ser. No. 132,432
Claims priority, application Great Britain, Apr. 9, 1970, 17,008/70
Int. Cl. B65d *29/04*; D04h *3/16*
U.S. Cl. 138—125 2 Claims



An extruded orientated tubular plastic mesh or net for packaging purposes comprising an inner set or layer of spaced parallel orientated strands extending in a helix around the tube, an outer set or layer of similarly spaced parallel orientated strands extending in an equal angle but opposite helix around the tube, the inner and outer sets or layers of strands being unconnected at their crossing points and a third set or layer of spaced strands, more orientated and attenuated than the helical strands, interconnecting the inner and outer sets or layers of helical strands along lines of connection points parallel to the tube axis, each strand of the third set or layer having alternate connection along its length with the outer sides of the strands of the inner set and the inner set of the strands of the outer set, each third set strand extending from connection point to adjacent connection point along a looped untensioned path.

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**3,744,530**

## POLYMER-HANDLING PROCESS

Robert J. Perry, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 19, 1971, Ser. No. 117,037
Int. Cl. F16l *9/14*
U.S. Cl. 138—145 1 Claim

Polyphenylene sulfide coated pipe is employed in the conduit system of a polymerization process. The method of coating the pipe is also disclosed.

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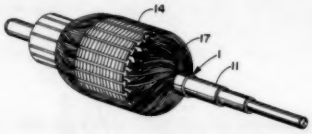
**3,744,531**

## PRECISION SPIRALLY WOUND SLEEVE

William A. Foll, 4565 Concord Drive, Fairview Park, Ohio, and Leonard Buckner, 16292 Paulding Boulevard, Brookpark, Ohio

Continuation of Ser. No. 34,150, May 4, 1970. This application Feb. 14, 1972, Ser. No. 226,193
Int. Cl. F16l *9/14*
U.S. Cl. 138—144 9 Claims




A multi-ply precision spirally wound sleeve characterized in that the inside ply is of biaxially creped Kraft paper (sometines called "X-crepe" paper) and the surrounding ply or plies are of substantially non-stretchable material such as Kraft paper, polyester film, polyimide film, etc., the plies being heat sealed together to provide a smooth and accurate outside diameter. The inside ply is resiliently radially compressible i.e. expansible in inside diameter, so that the sleeve may be snugly fitted on an armature shaft without increase in outside diameter or the sleeve may be employed as a coil form for an adjustable inductor with the tuning slug of powdered iron or brass screwed directly into the sleeve without prior formation of threads or indentations in the inside ply.

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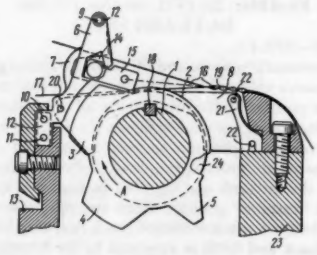
**3,744,532**

## BEATING UP DEVICE FOR LOOMS

Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49, Moscow, U.S.S.R.

Filed Sept. 22, 1971, Ser. No. 182,657
Int. Cl. D03d *49/60*, *41/00*
U.S. Cl. 139—188 1 Claim



A device in which a reed in the form of disks with teeth freely mounted on a drive shaft, is provided with guide rings with one ring being arranged between two disks. The disks are posi-

tioned relative to each other so that their teeth define screw-type surfaces. Clearances are provided between the disks for separating plates, between which there are also clearances for the passage of warp threads.

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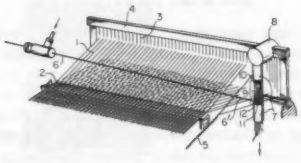
**3,744,533**

## ADJUSTMENT OF FILLING TENSION IN FLUID JET LOOM AND APPARATUS THEREOF

**Seisaku Yano, Kanazawa-shi; Shinichi Hosono, Komatsu-shi; Kazuyoshi Kida, Komatsu-shi, and Sigezi Yamazaki, both of Komatsu-shi, all of Japan, assignors to Teijin Limited, Kita-ku, Osaka, Japan**

**Filed Aug. 3, 1971, Ser. No. 168,622**
**Int. Cl. D03d *47/34, 45/50***
**U.S. Cl. 139—194** **8 Claims**



Filling yarn tension adjusting apparatus for use in a fluid jet loom including a suction jet established outside the selvage on one side of the fell of cloth to receive the tip of a projected filling yarn with substantially constant tension, the suction jet being movable along with a reed of the loom to permit beating without bending or varying the tension in the filling yarn. The sucking of the filling yarn with a substantially constant tension permits the use of a detector device for mechanically sensing the presence of the filling yarn and a control device for timing the cutting of the filling yarn. In one modification, the suction jet forms a guidance path for initially sucking the tip of the filling yarn and cooperates with a surrounding tension path at an annular opening to provide constant tension of the filling yarn.

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**3,744,534**

## PROTECTIVE CLOTHING FABRIC

**Malcolm C. Henry, Harvard; Richard N. Macnair, Cambridge, both of Mass., and Richard L. Erickson, Everett, Wash., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 12, 1972, Ser. No. 243,436**
**Int. Cl. D03d *15/00***
**U.S. Cl. 139—426** **10 Claims**

A flame-resistant and toxic chemical-agent protective clothing fabric woven of aromatic polyamide yarns and carbon yarns having at least 12 mg of carbon yarn per square centimeter of fabric, said carbon yarns having a carbon tetrachloride vapor sorption capacity of at least 15 percent by weight.

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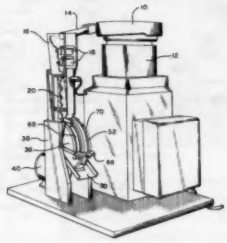
**3,744,535**

## LEAD STRAIGHTENER FOR AXIAL LEAD COMPONENTS

**Edward F. DuBois, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.**

**Filed Sept. 20, 1971, Ser. No. 182,020**
**Int. Cl. B21f *1/02***
**U.S. Cl. 140—147** **12 Claims**

Apparatus for straightening bent leads extending axially from an electrical component, such as a magnetic reed switch. Components are supplied individually to a rotating wheel having portions on its periphery for rotatably supporting the components with the leads extending outwardly from each side between a pair of guides which become increasingly narrower as the leads are rotatably moved therethrough. Means supporting the leads at or near the point of their connection to the component, together with the rotating movement through the progressively narrower guides straightens the leads without damage to the components.



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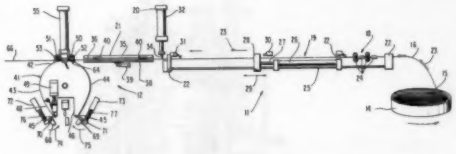
**3,744,536**

## TOILET SEAT LID COVER STRETCHER, PROCESS AND APPARATUS

**Fred F. Stahl, Jr., Ellijay; J. Marvin Eidson, Atlanta, and G. Dale Plemons, Crandall, all of Ga., assignors to Hampton Mills, Inc., Ellijay, Ga.**

**Filed Dec. 1, 1971, Ser. No. 203,538**
**Int. Cl. B21f *37/00***
**U.S. Cl. 140—88** **13 Claims**



A stretcher for the cover of a toilet seat lid is formed by bending a length of wire about the peripheral approximately egg-shaped upper and side edges of a flat forming plate and folding the ends of the wire length inwardly toward each other across a flat lower edge of the forming plate. The ends of the wire length are trimmed and connected together to form the closed loop stretcher. The stretcher is then placed in the cover of a toilet seat lid so as to hold the cover in a generally flat, stretched configuration for packing, shipment and display in the retail store.

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**3,744,537**

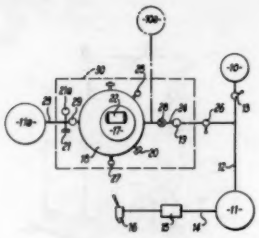
## GAS RECOVERY METHOD AND APPARATUS

**Samuel Peter Cole, Pasture Gate, England, assignor to J. W. Lees & Company (Brewers) Limited, Middleton and the Lake of Mann, England**

**Filed Apr. 28, 1971, Ser. No. 138,092**
**Claims priority, application Great Britain, Apr. 29, 1970, 20511/70**
**Int. Cl. B65b *1/04, 3/04***
**U.S. Cl. 141—4** **11 Claims**

A method of reclaiming the gas used for the dispensing of liquids from a container or to assist in enabling liquids to be dispensed and thereby enable the gas to be re-used. The apparatus for carrying out the above method including a gas compressor and container means for connection thereto, another container from which liquid is to be dispensed, and at least one gas cylinder, means for connecting an empty con-

tainer to the gas container and compressor to enable gas from the empty container to be pumped to the gas container and



pressure regulating means to insure that pressurization of the gas container cannot take place.

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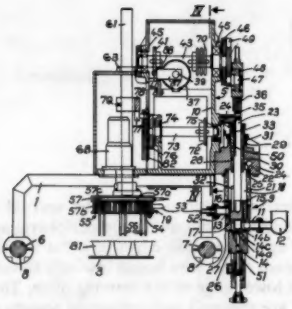
**3,744,538**

## APPARATUS FOR METERING AND DISTRIBUTING LIQUID AND PASTE-LIKE SUBSTANCES

**Jean Roger Nasica, and Roland Marc Torterotot, both of Paris, France, assignors to Intercan S.A. Chez la Fiduciaire, Wanner, Switzerland**

**Filed Nov. 13, 1970, Ser. No. 89,292**
**Claims priority, application France, Nov. 24, 1969, 6940447**
**Int. Cl. B65b *37/20***
**U.S. Cl. 141—242** **20 Claims**



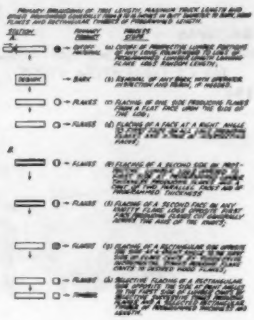
Apparatus for metering and dispensing liquid and paste-like substances, particularly dairy products or pharmaceutical products, and adapted to be incorporated in a packing machine, comprising a plurality of metering means each having a plunger partly surrounded by a skirt like diaphragm and each being connectable to a common source of a substance to be metered and dispensed and to a respective one of a plurality of distributing means; pneumatic control valves to control supply of the substance to the metering means and dispensing of the substance through outlet ports of the distributing mean; means for actuating the plungers of the metering means to carry out discharge strokes to transfer substance in the metering means to the distributing means, the plunger being indpendent of said means for actuating during a filling stroke and at the end of the filling stroke co-operating with an adjustable stop, each distributing means being movable, during dispensing of the substance, a distance at least equal to the height of the container to be filled and having drive means to ensure a retraction movement from the container which it is filling as the level of the substance dispensed into the container rises.

**3,744,539**

## LOG FLACING AND PARTING APPARATUS

**Donald L. Johnson, 3 Conway Springs Drive, Tacoma, Wash.**

**Division of Ser. No. 860,970, Sept. 25, 1969, Pat. No. 3,650,307, which is a division of Ser. No. 635,639, April 12, 1967, Pat. No. 3,472,296. This application Dec. 21, 1971, Ser. No. 210,500**
**Int. Cl. B27c *1/00***
**U.S. Cl. 144—176** **10 Claims**



A unified primary flacer mill for the selective reduction of roundwood to bark, bolts for decorative veneer, wood flakes or chips, lumber and timbers for use as such or for subsequent reduction to flat sliced rectangular veneer. The mill consists of two independent systems for producing bark and flakes or chips. Thinnings and other small wood to eight inches in diameter are delivered to one station. Larger roundwood possibly suitable for lumber or timbers is delivered to other stations. Flaking or chipping and surfacing heads replace saws for all outside cuts. Apparatus provides adequate support for the wood during flacing and parting and good operator view of the work for selective breakdown.

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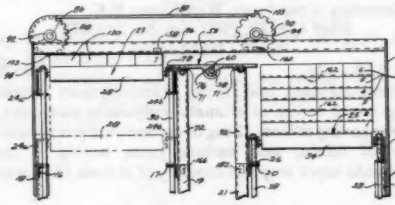
**3,744,540**

## MULTI-MORTISING MACHINE

**Charles E. Wirch, 1366 E. Palm, Altadena, Calif.**

**Filed Nov. 18, 1971, Ser. No. 199,959**
**Int. Cl. B27**
**U.S. Cl. 144—309 L** **15 Claims**



A multi-mortising machine cuts longitudinally spaced apart notches across the width of a plurality of elongated beams in preparation for their use as plate material in the construction of building wall frames. The machine includes a series of spaced rotary mortising blades having working edges spaced above a stationary work support bed. A stack of side-by-side uncut beams is mounted on an elevator bed which progressively raises each row of beams in the stack above the plane of the work support bed. The beams are fed across the bed into contact with the mortising blades to notch the beams. Thereafter, the notched beams are fed to a movable accumulator bed, while a new row of beams is raised above the plane of the work support bed in preparation for the next mortising

cycle. The machine continues to automatically feed uncut beams to the work support bed, mortise them, and collect the mortised beams until all the beams in the stack are mortised.

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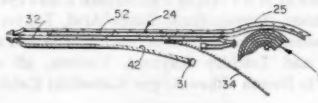
**3,744,541**
**WALLET**

**Harold N. Brauhut, c/o Honey Toy Industries, Inc., 200 Fifth Avenue, New York, N.Y.**

**Filed Dec. 22, 1971, Ser. No. 211,027**
**Int. Cl. A63j** *23/00*
**U.S. Cl. 150—35** **10 Claims**




A wallet for confining visual intelligence and permitting secret observation of the latter during confinement, said wallet including a pair of pockets for removably receiving opposite portions of a book binding-cover, and a pair of partially transparent pockets overlying the first said pockets respectively for receiving visual intelligence, one of the pockets for receiving an associated portion of the binding-cover including a louvered array of transparent and opaque zones extending in alternate succession for permitting limited observation of said visual intelligence when said book binding-cover is removed therefrom.

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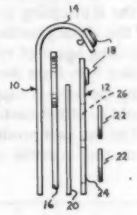
**3,744,542**
**CASE FOR GOLF TOOL**

**James H. Stephens, 432 Blackstone Drive, Erie, Pa., and Richard D. Grunert, 150 Buckland Avenue, Rochester, N.Y.**

**Filed June 1, 1971, Ser. No. 148,678**
**Int. Cl. B65d** *65/02*
**U.S. Cl. 150—52 R** **6 Claims**




A golf tool case retains both a pointed golf tool and at least magnetizable golf ball markers by comprising a pair of sheets of flexible material having a third permanent magnet-type sheet of flexible material sandwiched between them. The first and third sheets of flexible material form the pocket for the golf tool, while the second sheet remains contiguous the permanent magnet third sheet and has one or more holes therein to hold golf ball markers to be retained by the permanent magnetic properties of the third sheet.

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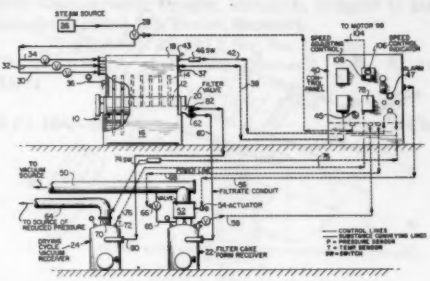
**3,744,543**
**METHOD FOR STEAM DRYING FILTER CAKE**

**Robert C. Emmett, Jr., Dundee, Ill., and Donald A. Dahlstrom, Salt Lake City, Utah, assignors to Envirotech Corporation, Salt Lake City, Utah**

**Filed Nov. 2, 1970, Ser. No. 86,180**
**Int. Cl. B01d** *37/04, 1/22, 1/14*
**U.S. Cl. 159—49** **4 Claims**

A method is disclosed for steam drying filter cake on a drum or disc type vacuum filter having a steam drying cycle wherein optimum cake thickness and moisture content is obtained at optimum thermal efficiency by controlling the vacuum during cake formation and controlling the filtration rate by control of the speed of rotation of the filter element.

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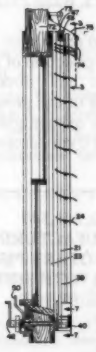
**3,744,544**
**OUTSIDE VENETIAN BLIND CONSTRUCTION**

**Adolph H. Wellensiek, 3300 Norwood Road, Shaker Heights, Ohio**

**Filed Sept. 23, 1971, Ser. No. 183,146**
**Int. Cl. E06b** *9/30*
**U.S. Cl. 160—169** **2 Claims**



An outside venetian blind construction for application in front of a window and by which the window louvers can be moved vertically to cover all or any selected fractional portion of the window, and in which all of the louvers may be moved into nested position in an overhead storage area to clear the window entirely when the louvers are not needed in use, and to provide novel means for tilting and holding the louvers at any desired angular position from the substantially vertical to the substantially horizontal position while they are extended over the window.

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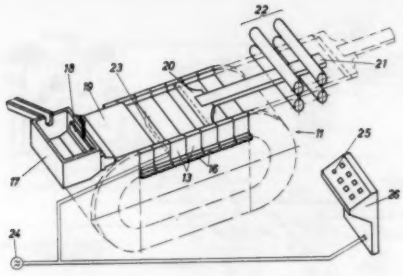
**3,744,545**
**AN ELECTRIC CIRCUIT FOR STARTING A CASTING MACHINE HAVING AN ENDLESS MOLD**

**Ivan Gyongyos, Montana, Switzerland, assignor to Prolizenz A.G., Chur, Switzerland**

**Filed May 5, 1971, Ser. No. 140,394**
**Claims priority, application Switzerland, May 8, 1970, 6844/70**
**Int. Cl. B22d** *17/32*
**U.S. Cl. 164—4** **2 Claims**

An electric circuit is disclosed according to which two insulated wires are clamped in a joint between two adjacent half-

molds of a mold track. The conductive tips of the wires project into the mold for being short-circuited by the front line of the




stream of poured-in melted metal. A signalling device is activated by the short-circuit to signal the instant for starting the movement of the mold tracks of the machine.

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**3,744,546**

**OXYGEN FLUSHING PRESSURE DIE-CASTING METHOD**

**Isao Miki, Fuji, and Yuusuke Ichikawa, Ihara-gun, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan**

**Filed Aug. 17, 1971, Ser. No. 172,579**

**Claims priority, application Japan, Aug. 18, 1970, 45/71740**

**Int. Cl. B22d *27/18***

**U.S. Cl. 164—55** **6 Claims**

This disclosure relates to an oxygen flush pressure die-casting method in which the production of shrinkage holes of large caliber appearing within the obtained casting can be prevented and the strength of the product can be remarkably improved by adding to the oxygen gas a minor amount of an inert gas, such as about 1–10 vol percent of the total volume of the mixture.

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**3,744,547**

**METHODS OF MANUFACTURING CRANK-CASE ENVELOPES FOR ROTARY PISTON INTERNAL COMBUSTION ENGINES WITH SINTERED METAL PLUG SUPPORT**

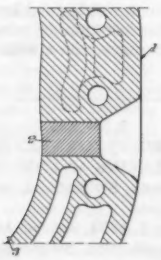
**Jean J. L. Panhard, Paris, France, assignor to Societe De Constructions Mecaniques Panhard & Levassor, Paris, France**

**Filed Dec. 24, 1969, Ser. No. 887,973**

**Claims priority, application France, Dec. 31, 1968, 68182899**

**Int. Cl. B22d *19/00*; F02b *53/12***

**U.S. Cl. 164—61** **15 Claims**



The envelope is of cast metal or alloy in which each sparkplug is mounted in a support, preferably externally cylindrical, of a sintered metal or alloy highly resistant to thermal shocks. The support is degassed in vaccum and coated by metallisation with the metal or alloy constituting the envelope. It is then placed as a core in a mould and the metal or alloy of the envelope is cast around it, so affecting a positive and durable bond between the support and the rest of the envelope. The envelope is of aluminimum magesium alloy or pig iron and the support of sintered aluminium, magnesium or nickel including 7 to 8 percent thoria respectively.

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**3,744,548**

**PROCESS FOR FORMING A CASTING WITH A SLIDING SURFACE BY HIGH PRESSURE CASTING**

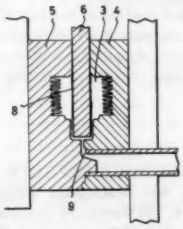
**Kazunori Ikeda, Tsurugajima; Takeo Arai, Tokyo; Kiyohisa Iwata; Tsuneo Kishida, both of Suzuka; Takuo Yamamura, Saitama, and Taichiro Kayama, Yamato, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 4, 1971, Ser. No. 186,352**

**Claims priority, application Japan, Oct. 3, 1970, 45/8637970**

**Int. Cl. B22d *19/08***

**U.S. Cl. 164—97** **9 Claims**




A process for forming a sliding surface of a casting by a high pressure casting operation in which particles of any material suitable for improving the lubricating property, wear resisting property or the like of the sliding surface are adhered, in the form of a layer, by a binding agent of synthetic resin to a surface of a casting mold that is to form the sliding surface of the cast product. The casting material is supplied under high pressure into the casting mold to effect casting and to transfer the particles from the mold to the cast product. The resin binding agent is burned by the casting material and serves as a release agent.

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**3,744,549**

**APPARATUS FOR AUTOMATIC PRODUCTION AND TRANSPORTATION OF FLASKLESS SAND MOULDS IN METAL CASTING**

**Eugen Buhler, Weg zur Walk 96, Burtenbach, Kreis Gunzburg, Germany**

**Division of Ser. No. 753,640, Aug. 9, 1968, Pat. No. 3,566,196. This application Jan. 8, 1971, Ser. No. 105,067**

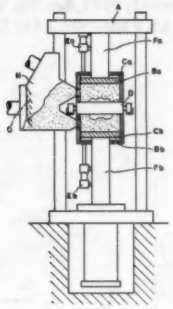
**Claims priority, application Germany, Aug. 18, 1967, P 15 83 526; Apr. 27, 1968, P 17 58 245.5**

**Int. Cl. B22c *15/24***

**U.S. Cl. 164—160** **33 Claims**

In a machine for producing and conveying horizontally divided flaskless sand molds, two mold frame cavities are formed above and below a match plate having a pattern on both sides and being movable along horizontal guides relatively to the cavities which are defined by vertically moving mold frames and vertically moving press dies co-operating with said mold frames. The molding sand is introduced pneumatically into the cavities through apertures in the dies and thereafter pressed by a corresponding relative movement between said press dies and match plate, after which the match plate is separated from the mold halves by a corresponding relative

movement between the press die and the mold frame on one hand, and the match plate on the other. The match plate is then moved laterally into a rest position and the mold is closed, if necessary, after the insertion of cores. The finished closed mold rests on the bottom press die which is substantially flush with the upper edge of the lower mold frame, and is then displaced laterally from the molding position by the match plate as it returns from its rest position. The ejected finished mold is added to a mold train, and the finished mold is at least supported on two sides by supporting means.



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**3,744,550**

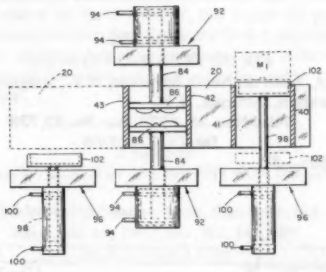
**SAND MOLD FORMATION**

**Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y.**

**Filed Feb. 12, 1971, Ser. No. 114,993**

**Int. Cl. B22c** *15/08*

**U.S. Cl. 164—172** **22 Claims**



Apparatus for forming sand molds comprising an elongate bed. The bed includes adjacent and partially enclosed receptacles for alternately receiving sand. A top cover plate is used for partially further closing the receptacles alternately. The top cover plate is operatively associated with the receptacles for alternately adjusting the configuration of the latter respectively from that configuration for operating on the sand disposed therein to form a mold to that configuration for releasing the mold so formed therein. A pair of opposing yet cooperable pattern plates are shiftably supported for entering together into each of the receptacles respectively, in opposing relation, to compact the sand disposed in the latter. A pair of mold ejectors are also utilized for entering into the receptacles alternately and ejecting the mold so formed in the latter. The elongate bed is reciprocatable longitudinally over a plurality of selected positions such that the pattern plates and ejectors can be aligned properly opposite selected of the receptacles alternately in operative association with the latter.

**3,744,551**

**MACHINE FOR PRODUCING MOULDS CONSISTING OF IDENTICAL MOULD PARTS THAT ARE LINED UP AGAINST EACH OTHER**

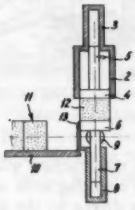
**Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark**

**Filed Feb. 25, 1972, Ser. No. 229,426**

**Claims priority, application Denmark, Mar. 4, 1971, 1015/71**

**Int. Cl. B22c** *15/02, 17/08*

**U.S. Cl. 164—183** **2 Claims**



In a mould part producing machine the moulds are successively pressed between an upper and a lower pattern board in a vertical chamber. By a downward movement the mould part is displaced out of the chamber and, while supported by the lower pattern board and a lateral support member, is tilted into a position from which it can be pushed onto a guideway on which the mould is successively assembled and is intermittently advanced.

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**3,744,552**

**MACHINE FOR PRODUCING MOULDS CONSISTING OF IDENTICAL MOULD PARTS**

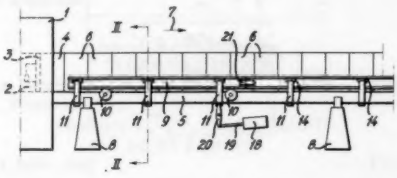
**Henning Borge Lundsgart, Karlslunde, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark**

**Filed Aug. 4, 1970, Ser. No. 60,829**

**Claims priority, application Denmark, Aug. 28, 1969, 4621/69**

**Int. Cl. B22c** *17/00*

**U.S. Cl. 164—187** **4 Claims**



In a continuous casting system, a machine for producing foundry moulds consisting of identical mould parts which after having been produced from foundry sand or similar material that is compressed by means of a pattern board, are pushed out onto a guideway and added to previously produced moulds, said guideway being equipped with reciprocating mould advancing means, the positive or mould advancing movement of which is coordinated with that of the pattern board.

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**3,744,553**

**CASTING WHEEL WELDED STEEL HUB**

**Norman Lesk, Mamaroneck, N.Y., assignor to Treadwell Corporation, New York, N.Y.**

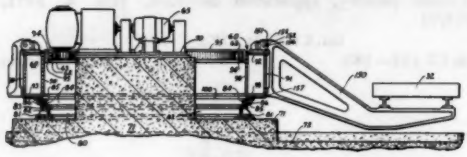
**Filed Feb. 17, 1972, Ser. No. 227,200**

**Int. Cl. B22d** *5/02*

**U.S. Cl. 164—326** **4 Claims**

In an improved casting wheel, for copper shapes such as anodes, wire bars, ingots, cakes, etc., particularly, which con-

sists of arms, supporting molds at their outer extremities, the arms being hung from a central hub formed on a supporting bed and driven by drive mechanism on the central bed, the improvement comprising a novel form of hub characterized by



its being of a box beam construction with internal bulkheads and external means for engaging arms and supporting them, and internal gear, to be driven by the drive mechanism, the whole being supported on an antifriction bearing in the central support mechanism.

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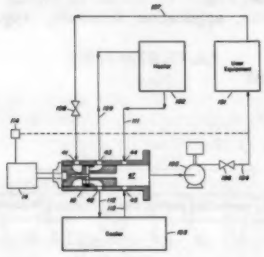
**3,744,554**
**FLOW DIVERTER**

**Floyd Hasselrus, Astoria, and William M. Teller, Scarborough, both of N.Y., assignors to American Hydrotherm Corporation**

**Division of Ser. No. 25,038, April 2, 1970, Pat. No. 3,630,242. This application June 1, 1971, Ser. No. 148,848**
**Int. Cl. F25h *29/00***
**U.S. Cl. 165—26** **10 Claims**

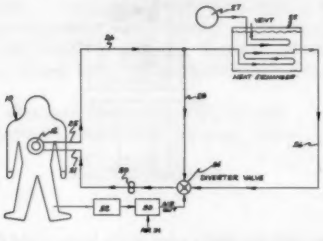


A flow diverter particularly suited for diverting the flow of a heat transfer liquid to be employed in user equipment to either a heater, cooler or neither, to control the temperature thereof, comprising a housing including an intermediate wall or partition dividing the housing into two chambers. The wall is provided with three passages, one connecting the first and second chambers and the remaining two connecting the first chamber to two outlet ports to be connected to heater and cooler inlets, respectively. The first chamber is provided with an inlet port to be connected to the outlet of user equipment and a flow diverting element for selectively connecting the passages in fluid flow communication with the first chamber. The second chamber is provided with two inlet ports to be connected to heater and cooler outlets, respectively, and an outlet port to be connected to the inlet of user equipment. The flow control element is constructed so as to balance the pressure forces on the top and bottom thereof thereby essentially eliminating the frictional forces which resist movement of the flow diverting element.

**3,744,555**
**AUTOMATIC CONTROL OF LIQUID COOLING GARMENT BY CUTANEOUS AND EXTERNAL AUDITORY MEATUS TEMPERATURES**

**James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Clay W. G. Fulcher, Houston, Tex., assignors to General Electric Company, New York, N.Y.**

**Filed Nov. 12, 1971, Ser. No. 198,355**
**Int. Cl. F28f *7/00*; A61f *7/00***
**U.S. Cl. 165—46** **8 Claims**



Automatic control apparatus for a liquid cooling garment responsive to actual physiological needs during work and rest periods of a man clothed in the liquid cooling garment. Four skin temperature readings and a reading taken at the external portion of the audiotry meatus are added and used as the control signal for a temperaure control valve regulating inlet water temperature for the liquid cooling garment. The control apparatus may comprise electronic circuits to which the temperatures are applied as control signals and an electro-pneumatic transducer attached to the control valve.

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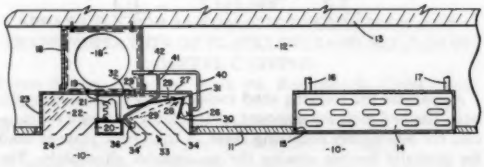
**3,744,556**
**AIR DISTRIBUTION SYSTEM**

**Richard A. Church, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Nov. 25, 1970, Ser. No. 92,738**
**Int. Cl. F24f *3/06***
**U.S. Cl. 165—57** **1 Claim**

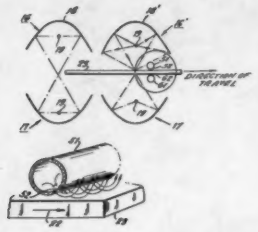


An air distribution system for providing treated air to an enclosure wherein the ceiling of the enclosure defines the lower surface of a plenum. Each of the enclosures served by the system has a heat exchanger disposed in an inlet to the plenum. High velocity primary air is discharged from a suitable duct to draw treated ambient or secondary air from the plenum. Secondary air from the enclosure flows into the plenum by passing in heat transfer relation with the heat exchange medium flowing through the heat exchange coil. A damper operates to regulate the quantity of secondary air drawn from the plenum.

## 3,744,557
## APPARATUS FOR FUSING AND SEALING PLATINGS AND THE LIKE

Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Inc., Hopewell, N.J.

Division of Ser. No. 872,917, Oct. 31, 1969, abandoned. This application July 19, 1971, Ser. No. 164,095
Int. Cl. F27b 9/12
U.S. Cl. 165—64 4 Claims



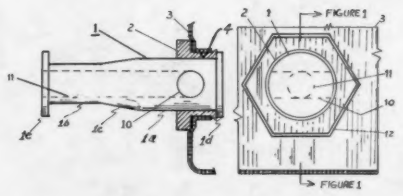

Apparatus for fusing lead-tin platings provided upon printed circuit boards in a continuous process. The boards are moved by suitable conveyor means through a plurality of infrared energy sources provided on groups arranged on opposite sides of said boards and adapted to focus radiant energy to a line image, which plural line images sweep across and irradiate the boards as they pass through the locations of the radiant energy sources. The positioning between the radiant energy sources, the energy level and frequency spectrum of the sources and cooling thereafter is controlled so as to melt the matrix of lead and tin particles to flow together and form an alloy which is metallurgically bonded to the copper conductor while minimizing the propensity of the plating to flow into plated-through holes so as to partially or completely block such holes.

In alloy platings of greater than 1 mil thickness an "air-knife" is provided immediately adjacent the last heating source on either or both sides of the board to produce a precipitous temperature drop from the flow temperature to a temperature slightly above the freeze point to reduce fluidity and mobility of the alloy especially in the region of plated-through holes.

## 3,744,558
## RADIATOR PLUG REPLACEMENT FOR DRAIN PET COCK

Bobby B. Childress, 145 Shadow Lane, Charlotte, N.C.

Filed July 13, 1971, Ser. No. 162,089
Int. Cl. F16k 13/00
U.S. Cl. 165—71 10 Claims

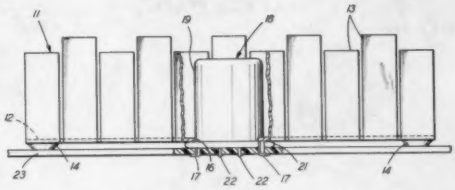



The invention is a threadless, solderless replacement valve plug for radiator pet cocks made of only two low cost parts. A valve spool having a peripheral taper and a region of large diameter and a region of small diameter carries a compressible bushing on the region of large diameter against an inner end flange of the valve spool. The compressible bushing snugly fits the region of larger diameter against the inner flange and is thus compressed within the radiator drain hole, the pressure of the coolant fluid maintaining a positive lock. The valve spool includes an axial hole extending in bore-like fashion substantially its length from an outer flanged end to terminate adjacent to the inner flanged end. A radial hole communicates with the axial bore-like hole to permit draining of the radiator when the valve spool is slid through the bushing to uncover the radial hole within the radiator. The region of lesser diameter and tapered region of the valve spool enables insertion of the plug as original equipment or as a repair kit for radiators with broken drains.

## 3,744,559
## HEAT-TRANSFER DEVICE FOR COOLING HEAT-GENERATING COMPONENTS

Ralph E. Overholt, Columbus, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 3, 1971, Ser. No. 120,661
Int. Cl. F28f 7/00
U.S. Cl. 165—80 3 Claims

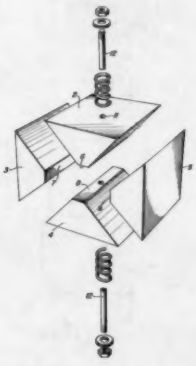


A heat-transfer device of unitary structure for dissipating heat generated by semiconductors and the like is composed of a heat-conducting metal. The device includes a flat base having fingers formed integrally and upwardly along longitudinal opposite edges thereof. An opening is formed in the central portion of the base to facilitate the positioning of the heat-transfer device over the accommodating structure of a semiconductor after the semiconductor has been assembled with and secured to a printing wiring board. The heat-transfer device is integrally formed with clinching tabs which are bent after the device has been assembled with the printed wiring board to secure the device with the board independently of the semiconductor.

## 3,744,560
## THERMAL BLOCK

William Henry Sell, Jr., Kingsville, Md., assignor to Isotopes, Inc., Westwood, N.J.

Filed Oct. 1, 1971, Ser. No. 185,511
Int. Cl. F28f 7/00
U.S. Cl. 165—185 5 Claims



A heat transferring device adapted for use in a thermoelectric generator which automatically compensates for shock,

vibration, and thermal expansion is disclosed. The device consists of a relatively solid block composed of four slideably moveable wedges arranged in opposing pairs so that the movement of one pair of wedges together causes the other pair of wedges to move apart, one pair of opposing wedges being provided with means biasing them together.

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**ERRATUM**

For Class 165—1 see:
Patent No. 3,745,050

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**3,744,561**

**DISPLACEABLE GUIDE FUNNEL FOR SUBMERGED WELLHEADS**

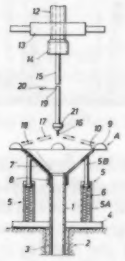
**Howard L. Shatto, Jr., and Johannes A. W. J. Van Dommelen, both of The Hague, Netherlands, assignors to Shell Oil, New York, N.Y.**

**Filed Dec. 2, 1971, Ser. No. 204,092**

**Claims priority, application Great Britain, Mar. 15, 1971, 6,882/71**

**Int. Cl. E21b** *33/035*

**U.S. Cl. 166—.5** **4 Claims**



A funnel shaped guide member is provided to guide a marine conductor to a submerged well head said guide member being displaceable to clear the way for the marine conductor to be landed on the submerged well head.

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**3,744,562**

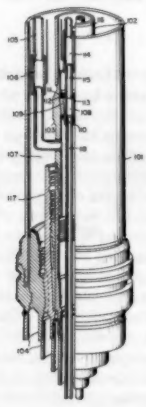
**BLOWOUT PREVENTION APPARATUS**

**Frank D. Priebe; Robert G. Tribble, and Frank T. Jones, all of Houston, Tex., assignors to Cities Service Oil Company, Tulsa, Okla.**

**Filed Dec. 14, 1970, Ser. No. 97,760**

**Int. Cl. E21b** *33/035*

**U.S. Cl. 166—.5** **7 Claims**



Apparatus comprising a failsafe series of shutoff valves therefore situated below the mudline of a completed well such that a rapid removal or damage of a wellhead assembly will not create a catastrophe as the well may be controlled at a point below the mud line.

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**3,744,563**

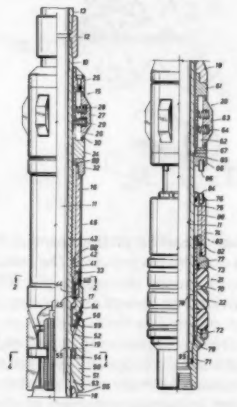
**RETRIEVABLE WELL PACKER APPARATUS**

**Howard L. McGill, 5434 Carew, Houston, Tex.**

**Division of Ser. No. 174,598, Aug. 25, 1971. This application Oct. 26, 1972, Ser. No. 300,927**

**Int. Cl. E21b** *23/06, 33/128*

**U.S. Cl. 166—139** **3 Claims**



In accordance with an illustrative embodiment of the present invention, a retrievable well packer apparatus includes a mandrel adapted for connection to a pipe string and carrying normally retracted slips that can be expanded into anchoring engagement with a well casing; a slip expander assembly on the mandrel below the slips and movable upwardly to expand the slips, and instrumentalities responsive to rotation of the mandrel by the pipe string for mechanically retracting the slips so that the slips cannot be accidentally set as the packer is being withdrawn from a well.

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**3,744,564**

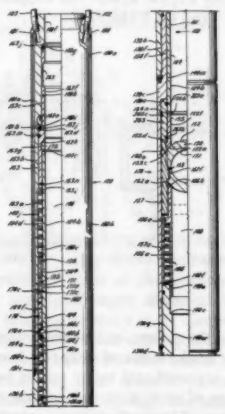
**SUBSURFACE WELL APPARATUS AND METHOD**

**James D. Mott, Houston, Tex., assignor to Hydril Company, Harris County, Tex.**

**Filed Apr. 6, 1971, Ser. No. 131,628**

**Int. Cl. E21b** *33/00*

**U.S. Cl. 166—224 S** **18 Claims**



A subsurface well apparatus for connection in a production tubing having a housing with a controlled ball type bore clo-

sure means therein for normally controlling flow of fluid through the bore of the tubing and adapted to receive, secure and operate a replaceable means for controlling flow in the bore of the housing when the closure means malfunctions. The means for controlling flow in the bore is installed and retrieved from the housing through the bore of the tubing by a method utilizing pressure in the bore of the tubing.

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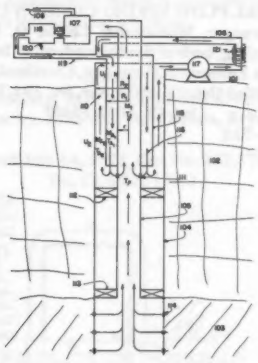
**3,744,565**

**APPARATUS AND PROCESS FOR THE SOLUTION AND HEATING OF SULFUR CONTAINING NATURAL GAS**

**Larry P. Brown, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.**

**Filed Jan. 22, 1971, Ser. No. 108,822**
**Int. Cl. E21b *43/00***
**U.S. Cl. 166—267** **2 Claims**



A hydrocarbon well producing principally hydrogen sulfide, carbon dioxide and free sulfur is produced by pumping a solvent into the well to dissolve the free sulfur contained therein. The solvent is heated and introduced at a point within the production string at which the sulfur would normally begin to precipitate from the produced gas stream.

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**3,744,566**

**SECONDARY OIL RECOVERY PROCESS**

**Miklos Tamas Szabo, Coraopolis; Jerry Emile Boothe, Pittsburgh; Andrew Jackson Sharpe, Jr., and Fred David Martin, both of McMurray, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.**

**Filed Mar. 16, 1972, Ser. No. 235,399**
**Int. Cl. E21b *43/22***
**U.S. Cl. 166—275** **8 Claims**

Polymers of (3-acrylamido-3-methyl) butyl trimethyl ammonium chloride and related N-(alkyl amino) acrylamides are used as additives to water for waterflooding in the secondary recovery of oil.

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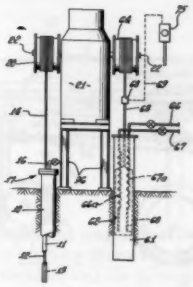
**3,744,567**

**POLISH ROD STUFFING BOX CAVITY**

**Donovan B. Grable, 2515 San Francisco Avenue, Long Beach, Calif.**

**Filed Dec. 30, 1971, Ser. No. 214,172**
**Int. Cl. E21b *33/03*, *43/00***
**U.S. Cl. 166—315** **16 Claims**

The invention concerns apparatus and method enabling conversion of a short stroke well pumping unit to long stroke operation. Cylindrical casing or the equivalent, which may be set underground, contains a stuffing box adapted to pass a wire line reciprocated polish rod, which suspends the rod string. A flow line extends within the casing to receive well fluid flowing upwardly via tubing extending below the stuffing



box, and to by-pass the flow upwardly around the stuffing box. The latter, when installed underground, is remotely adjustable.

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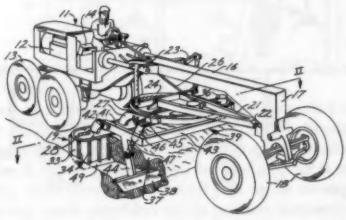
**3,744,568**

**MOTOR GRADER WITH POWER ACTUATED SIDE CASTING MEANS**

**Marvin E. Beyers; James A. Bockhaus, both of Peoria, and Robert N. Stedman, Chillicothe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Continuation of Ser. No. 15,664, March 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 735,063, June 6, 1968. This application Mar. 9, 1972, Ser. No. 233,334**
**Int. Cl. A01b *3/00***
**U.S. Cl. 172—33** **6 Claims**



A motor grader has a cutting blade spaced forward from a power driven conveyor belt that extends parallel to the blade. The cutting blade loosens a layer of earth which passes over the blade and is subsequently intercepted and cast to one side by the belt. A second blade may be carried beneath the belt to provide a smooth finish cut. The mechanism efficiently side casts earth without requiring that the effective width of cut be reduced by conventional angling of the blade structure.

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**3,744,569**

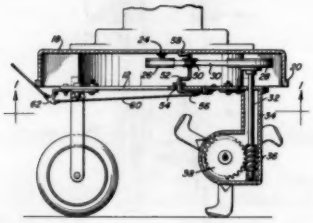
**TILLER ATTACHMENT FOR POWER MOWERS**

**Benjamin Ehrlich, 3200 Meadowlark Lane, Great Bend, Kans.**

**Filed Dec. 13, 1971, Ser. No. 207,489**
**Int. Cl. A01b *33/00***
**U.S. Cl. 172—42** **6 Claims**

A tiller assembly for attachment to power mowers or the like, said assembly comprising a support framework adapted to be conveniently connected to a power mower housing, a drive shaft rotatably carried by the framework and operatively

connected to a plurality of tiller tines for rotation thereof, and a drive belt connecting the power mower output shaft with the drive shaft and being provided with means for selectively adjusting the belt tension during operation of the assembly.



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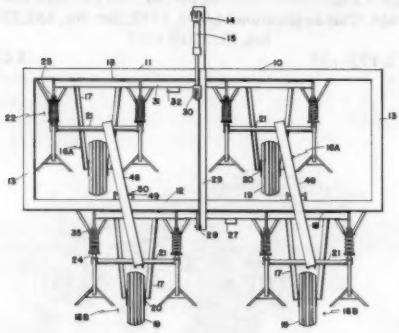
**3,744,570**
**CULTIVATOR**
**Kelly A. Krammer, Box 144, Cupar, Saskatchewan, Canada**
**Filed Nov. 1, 1971, Ser. No. 194,134**
**Int. Cl. A01b** *49/00, 63/00*
**U.S. Cl. 172—310** **8 Claims**



A rectangular frame carries front and rear pairs of cultivator shanks pivotally connected to the frame with the depth of the cultivating implements being controlled by the wheels. A ground wheel is journalled to a fork which in turn is also pivotally connected to the frame and situated between each pair of cultivating shanks. A balance bar is pivoted intermediate the ends thereof to the frame and engages a cross member of adjacent front and rear wheels thus maintaining the wheels in contact with the ground at all times regardless of the uneveness of the terrain.

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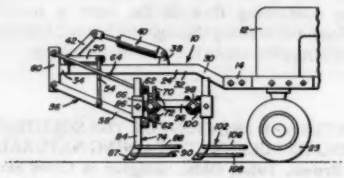
**3,744,571**
**VINE TURNER**
**John J. Nichols, 2325 N.W. 17th St., Oklahoma City, Okla., and Arvel L. Cowell, Route 1, Box 98-A, Morrilton, Ark.**
**Filed Sept. 3, 1970, Ser. No. 69,318**
**Int. Cl. A01b** *35/32*
**U.S. Cl. 172—517** **1 Claim**

An implement to be mounted forward of a farm vehicle and including structural members that are vertically adjustable. Vine deflecting members are slidably mounted to the structural members to allow lateral adjustment of the deflecting members relative to the wheels of the vehicle. The deflecting members lift encountered vines and then push them laterally away from the path of the vehicle to permit its free passage.



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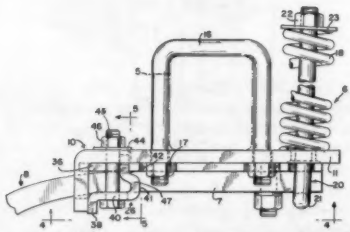
**3,744,572**
**CHISEL PLOW SPRING CUSHION CLAMP**
**Earl D. Zeltwanger, Mishawaka; LaRon O. Quickstad, and Roger D. Laidig, both of South Bend, all of Ind., assignors to White Farm Equipment Company, Cleveland, Ohio**
**Filed Oct. 22, 1971, Ser. No. 191,748**
**Int. Cl. A01b** *15/00*
**U.S. Cl. 172—710** **8 Claims**



A spring cushion clamp for mounting a tool shank onto the tool support bar of a ground working implement, e.g., a chisel plow. In addition to a main bracket having a depending flange at the rear and spring cushion means at the front, including an upwardly biased U-member or U-bolt for engaging under the front end of a tool shank, the clamp comprises a keeper plate that fits underneath the horizontal portion of the bracket with a rearwardly projecting tongue extending through an opening in the corner of the bracket and a special corner clamping member secured in the inside of the corner of the main bracket. The clamping member is bifurcated to provide an opening therein through which the tool shank and keeper plate tongue extend. Shoulders on the keeper plate at the root of the tongue engage and pivot against the legs of the bifurcated portion of the clamping member. The bottom edge of the opening between the legs of the corner clamping member serves as a stop which the tool shank engages during tilting.

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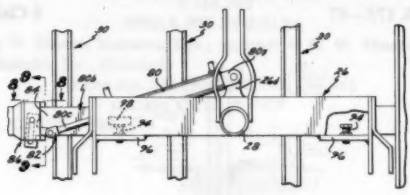
**3,744,573**
**ROLL OVER PLOW**
**William F. Mellen, Fullerton, Calif., assignor to Alice Marian Mellen, Anaheim, Calif.**
**Filed July 2, 1971, Ser. No. 159,116**
**Int. Cl. A01b** *3/28*
**U.S. Cl. 172—225** **6 Claims**

This invention is relative to two way roll over plows, with particular reference to mechanisms for rolling the plow assembly from one operating position to another. It is characterized by having a hydraulic actuator for rotating the plow assembly, but wherein lost motion means is provided for insuring that the hydraulic actuator is able to turn the assembly

over center each and every time. Such lost motion means causes a slotted member, which cooperates with a pin as well as a bracket, to make the hydraulic actuator operate behind the center of weight of the plow assembly. This invention also



relates to mounting means for a hydraulic actuator to ensure that it is fully extended and retracted when used to rotate the plow assembly. Also locking means is provided for locking the plow assembly in its operating positions.

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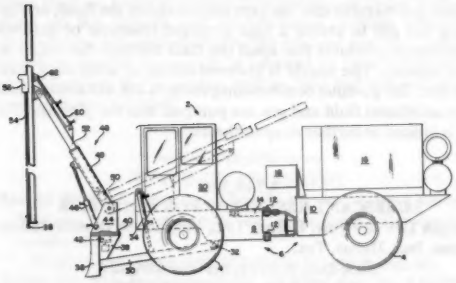
**3,744,574**

**MOBILE ROCK DRILLING UNIT**

**Wesley B. K. Carley, 2156 Neil St., Victoria, British Columbia, Canada**

**Filed July 14, 1971, Ser. No. 162,578**
**Int. Cl. E21c** *11/02*
**U.S. Cl. 173—27** **8 Claims**



A self propelled, articulated vehicle having a rock drilling unit mounted upon one section. The rock drilling unit is directly mounted to a ground engaging stabilizer unit which is pivotally secured to the section whereby the stabilizer unit may be raised for moving the entire vehicle from place to place. The stabilizer unit will be placed in a ground contacting position during the operation of the rock drill whereby vibration and shock is transmitted to the ground instead of to the vehicle. The vehicle is entirely self contained in that it has a compressor and other equipment necessary for the rock drilling operation.

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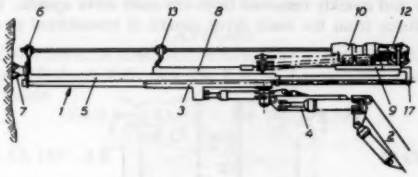
**3,744,575**

**ROCK DRILL FEED BAR**

**Axel Strommes, Borlange, Sweden, assignor to Atlas Copco Aktiebolag, Necka, Sweden**

**Filed Sept. 1, 1971, Ser. No. 176,927**
**Claims priority, application Sweden, Sept. 8, 1970, 12137/70**
**Int. Cl. E21c** *5/11, 9/00*
**U.S. Cl. 173—31** **5 Claims**

A rock drill feed bar supported by a drill boom is longitudinally displacable as well as extendable. For that reason it comprises a first, a second and a third bar member which are slidably attached to each other. The first bar member is box-shaped and undisplacably connected to the drill boom and lodges a hydraulic piston-cylinder actuating device which is arranged to move the bar members relative to each other for



accomplishing extension and longitudinal displacement of the feed bar. A rock drill carrying slide and a hose reel are guided upon the third bar member and are arranged to be fed along this bar member by means of a feeding device.

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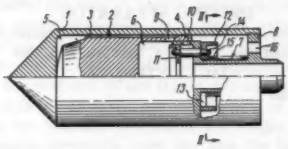
**3,744,576**

**REVERSIBLE PERCUSSION DEVICE**

**Boris Vasilievich Sudnishnikov, Krasny prospekt, 56, kv. 59; Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, Ia, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, Ia, kv. 68; Konstantin Konstantinovich Tupitsyn, ulitsa Krylova, 3, kv. 37, and Vladimir Dmitrievich Plavskikh, ulitsa Kamenskaya, 84v, kv. 33, all of Novosibirsk, U.S.S.R.**

**Filed Feb. 3, 1971, Ser. No. 112,350**
**Int. Cl. E21b** *3/12*
**U.S. Cl. 173—91** **2 Claims**



Pneumatic reversible percussion device used for making holes in the ground.

The device is characterized in that under the action of compressed air the striker reciprocates in a hollow housing and delivers percussions upon the latter, thereby making the device move in to the ground. The compressed air is supplied into working chambers of the housing along an air-supplying bushing having ports provided on its portion interacting with the striker, overlapped by a slide valve during the forward movement of the device and used to outstrip the supply of compressed air into a front chamber during the reverse movement of the device. The slide valve is rigidly connected with a spring-loaded sleeve that is loosely mounted on the bushing and is actuated by a spring when the device is switched over to a reverse movement by way of dropping the pressure, as compared to the nominal one.

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**3,744,577**

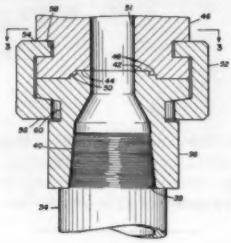
**EARTH BORING MACHINE WITH A READILY REPLACEABLE DRILL ROD CHUCK**

**Raymond Leroy Williams, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Oct. 1, 1971, Ser. No. 185,603**
**Int. Cl. E21b** *17/046*
**U.S. Cl. 173—163** **18 Claims**

Rotary, compressive and tensile forces are transmitted through a replaceable chuck to a rotary drill string to bore a large diameter hole by initially drilling a small diameter hole and subsequently enlarging the small diameter hole into the desired large diameter hole with a reaming operation. The

drill string is rotated with rotary drilling equipment mounted upon a movable carriage. The uppermost drill rod of the drill string is connected to the main drive spindle of the rotary drilling equipment by the replaceable chuck. A pair of cap screws and a clamp ring allow the replaceable chuck to be easily and quickly removed from the main drive spindle. Rotary force from the main drive spindle is transmitted to the



replaceable chuck by a square recess on the main drive spindle that mates with a raised square on the replaceable chuck. The replaceable chuck is provided with an axial floating action for make up and break out of the threaded connection between the drill stem and the replaceable chuck. A register pilot on the replaceable chuck mates with a pilot recess on the main drive spindle to provide alignment.

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**3,744,578**

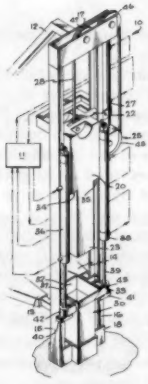
**COMBINED EARTH IMPACT EXCAVATION AND POST DRIVING APPARATUS**

**Edgar J. Lisenby, 13136½ Saticoy St., Los Angeles, Calif.**

**Filed Dec. 29, 1971, Ser. No. 213,285**

**Int. Cl. E21b *1/02***

**U.S. Cl. 175—23** **9 Claims**



Apparatus is disclosed herein that is carried on a mobile transporter and which includes an upright frame laterally cantilevered from the bed of the transporter for supporting a vertically movable weight having an impacting ram for formation of the hole and a sidewall supporting sleeve. Hydraulic piston and cylinder assemblages are employed for selectively operating the weight so as to impact the sleeve for post hole sidewall support and subsequently for driving the post as supported by the sleeve and for removing the sleeve to complete the procedure.

**3,744,579**

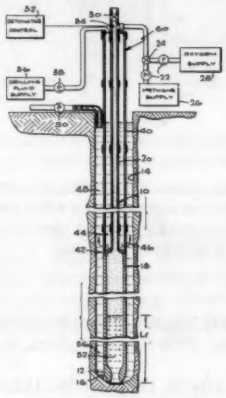
**EROSION WELL DRILLING METHOD AND APPARATUS**

**Charles S. Godfrey, Berkeley, Calif., assignor to Physics International Co., San Leandro, Calif.**

**Filed June 1, 1971, Ser. No. 148,697**

**Int. Cl. E21b *37/00, 45/00***

**U.S. Cl. 175—67** **8 Claims**



A method for drilling deep wells, which includes lowering a high pressure pipe with a nozzle at its bottom down the well, filling the lower half of the pipe with a fluid, pumping an ignitable gas mixture into the pipe region above the fluid, and igniting the gas to create a high pressure reservoir of gaseous combustion products that eject the fluid through the nozzle at high velocity. The nozzle is lowered during or after each fluid ejection, the gaseous combustion products are exhausted, and then additional fluid and gas are pumped into the pipe and the gas is ignited to further deepen the well.

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**3,744,580**

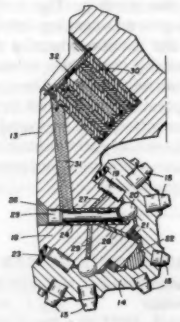
**LUBRICANT RESERVOIR FOR ROCK BITS**

**Morgan LeVon Crow, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Dec. 9, 1971, Ser. No. 206,425**

**Int. Cl. F16c *19/00*; E21b *9/10***

**U.S. Cl. 175—228** **7 Claims**



A cone cutter is rotatably mounted upon a bearing pin extending from the arm of a rotary rock bit. Lubricant is supplied to the bearings between the cone cutter and the bearing pin by a protracted passageway containing lubricant. The protracted passageway extends through the arm and bearing pin of the bit to the bearing area with the outer end of the protracted passageway connected to the exterior surface of

the bit. The protracted passageway provides pressure equalization between the pressure of the lubricant and the pressure of fluid in the well bore and insures that lubricant reaching the bearing area is free of contaminants.

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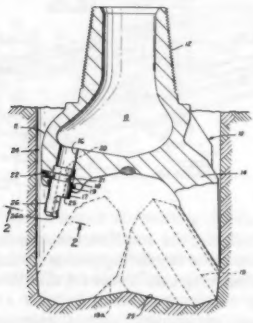
**3,744,581**
**DRILL BIT NOZZLES**

**Roy N. Moore, Houston, Tex., assignor to G. W. Murphy Industries, Inc., Houston**

**Filed Jan. 28, 1972, Ser. No. 221,541**
**Int. Cl. E21b *9/08***
**U.S. Cl. 175—340** **7 Claims**



A fluid nozzle for a roller cutter drill bit wherein the nozzle has a bore, an inboard portion terminating just above adjacent parts of the cutters and an outboard portion extending downwardly substantially below the inboard portion. The outboard portion of the nozzle is adapted to form a barrier or shield between the emerging drilling fluid and the wall of the bore hole being drilled.

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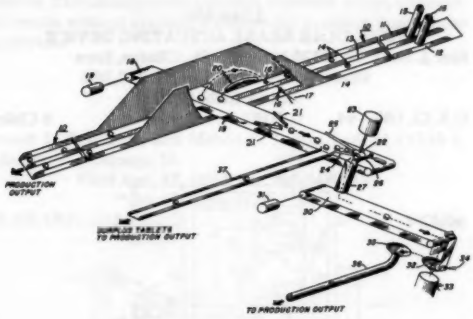
**3,744,582**
**WEIGHING APPARATUS**

**Ronald Withnell, Wading River, N.Y., and Leon Lachman, Millburn, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 766,018, Sept. 30, 1968, Pat. No. 3,595,329. This application Mar. 19, 1971, Ser. No. 126,258**
**Int. Cl. G01g *3/16, 11/04, 11/08***
**U.S. Cl. 177—50** **9 Claims**




An arrangement for determining the weight of an object relative to a predetermined reference weight. A compliant system is vibrated along a predetermined axis substantially at the mechanical resonance frequency, said system having means for supporting the object. The system oscillation amplitude is proportional to the inertia of the system and is independent of gravity. The oscillation amplitude of the system is converted into an electrical signal which is compared with a reference signal representative of the reference weight and an error signal is utilized to provide a measurement and/or control function in correspondence with the difference between the weight of the object and the reference weight.

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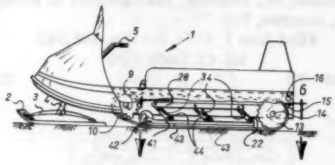
**3,744,583**
**SNOW VEHICLE AND SUSPENSION SYSTEM THEREFOR**

**Eugene Bedard, P.O. Box 29, R.R. 4, Laurierville, Quebec, Canada**

**Filed Sept. 13, 1971, Ser. No. 179,779**
**Int. Cl. B62m *27/02***
**U.S. Cl. 180—5 R** **19 Claims**



A snow vehicle having front steering skis and an endless track, more particularly a snowmobile, and a suspension system of the slide bar type which is entirely supported relative to the body of the vehicle by a single axle and which is provided with pivotally supported slide bars. A rigid frame is pivoted intermediate its ends on the single axle; said frame has second axles on which spring biased suspension arms are pivotally mounted in pairs and the slide bars are pivotally mounted on the lower end of the suspension arms towards engagement with the ground-engaging run of the track. The two slide bars are independently pivotally supported, but a releasable lock enables the user to obtain unitary movement thereof. The arrangement mounted on a single axle can also be modified to provide a single slide bar for use with a track having a single row of central sprocket engaging holes. Springs carried by the rear end of the frame, are engageable with the vehicle chassis to resiliently prevent dipping of the front ends of the slide bar and also to transfer the weight of the vehicle and passengers forwardly onto the skis for better steering. Shock absorbers are mounted between the slide bars and the frame for a smoother ride.

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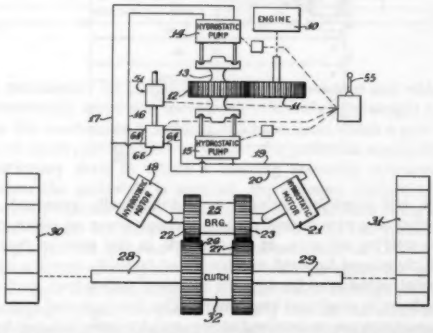
**3,744,584**
**HYDROSTATIC TRANSMISSION MOTORS AND COORDINATING CLUTCH FOR SAME**

**John F. Swift, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Apr. 29, 1971, Ser. No. 138,511**
**Int. Cl. B62d *11/04***
**U.S. Cl. 180—6.48** **5 Claims**




Clutch for interconnecting tracks at two sides of a crawler tractor driven by separate hydrostatic motors. The tracks are

driven at the same speed to move the tractor in a straight line. The clutch connects the two sides of the tractor drive, assuring drive at the same speed. Drive for each side comprises a rotatable input member, a hydrostatic pump driven thereby, a hydrostatic motor driven by the pump, and a rotatable output member driven by the motor. The clutch is between the rotatable output members of the two sides of the drive and is engaged for positive inter-connection of the two output members.

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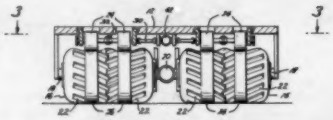
**3,744,585**

## VEHICLE HAVING AXIAL SUPPORTING WHEELS ENGAGEABLE WITH LOAD BEARING DRIVING ROLLERS

**John G. Holand, Sr., Houston, Tex., assignor to Rolligan Corporation, Houston, Tex.**

**Filed June 1, 1971, Ser. No. 148,585**
**Int. Cl. B60k** *9/00*
**U.S. Cl. 180—74** **25 Claims**



A vehicle having elongated, flexible-walled wheels carrying a load on their axles and having one or more load supporting rollers engageable with the outer periphery of the wheel. The vehicle being axially driven and/or roller driven. The rollers being movable relative to the wheels into and out of contact with the wheel. The wheels including a plurality of cleats for providing a gripping relationship with the ground and the outer periphery also including at least one portion free of cleats extending circumferentially around the wheel for engaging one or more supporting and/or driving rollers. The smooth portion on the wheel including a plurality of continously circumferentially wrapped layers of material whose outer edges decrease inwardly to the wheel.

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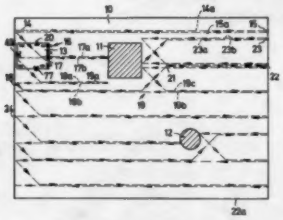
**3,744,586**

## AUTOMATICALLY STEERED SELF-PROPELLED VEHICLE

**Erich Leinauer, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Oct. 5, 1971, Ser. No. 186,678**
**Claims priority, application Germany, Oct. 7, 1970, P 20 49 136.5**
**Int. Cl. B62d** *1/24*
**U.S. Cl. 180—79.1** **11 Claims**



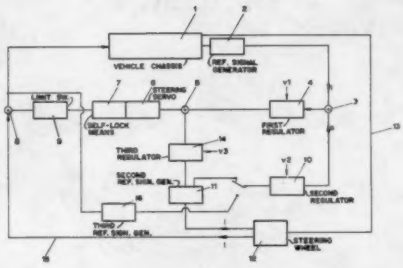
A self-propelled vehicle is automatically reversed and steered to a new path if sensors thereon sense an obstruction surrounding an area, or an obstacle in the area so that the vehicle moves forward, rearward and laterally over the entire unobstructed area for treating the same with a tool, such as a brush or agricultural implement. The forward and rearward movements are maintained along straight paths independently of irregularities prevelant in the area, tolerances in the steering control system of the vehicle or other such influences.

**3,744,587**

## STEERING ARRANGEMENT FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES, HAVING A COMPENSATION FOR SIDEWISE FORCE AFFECTS

**Harald Schimkat, Flechtorf, and Wolfgang Lincke, Wolfsburg, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany**

**Filed Aug. 2, 1971, Ser. No. 168,186**
**Int. Cl. B62d** *5/00*
**U.S. Cl. 180—79.2 R** **29 Claims**




In a motor vehicle, the combination of a steering arrangement with a control or regulating means for compensating the influence of distrubing side forces on the traveling direction, the regulating means comprising at least a first reference signal generator producing signals corresponding to or representative of the transverse movements of the vehicle, a coupling member receiving the signals of the first reference signal generator, a second reference signal generator producing signals representative of the steering instructions coming from the operator of the vehicle, the signals of the second reference signal generator being applied to the coupling member, a first regulator device coupled to the coupling member, the latter forming a regulating magnitude from the signals of the first reference generator and of the second reference generator and delivering such magnitude to the first regulator device, a steering servo mechanism coupled to the first regulator, the coupling member comprising a subtraction member forming a difference of the signals of the first reference signal generator and the second signal generator, whereby the control magnitude will not only lead to eliminate the undesired side force affects but also to improve the traveling and steering relation of the operator in contrast to a vehicle which does not have the control arrangement according to the present invention.

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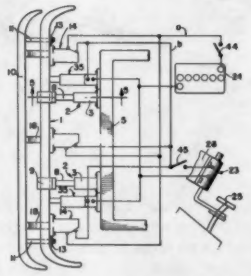
**3,744,588**

## VEHICULAR BRAKE ACTUATING DEVICE

**Mac J. Nave, Sr., 2220 McKinley St., Clinton, Iowa**

**Filed Dec. 28, 1971, Ser. No. 212,902**
**Int. Cl. B60r** *19/02*
**U.S. Cl. 180—94** **6 Claims**



A motor vehicle includes a bumper assembly having a main bumper bar shock-mounted to the vehicle frame and support-

ing an outer contact bar which, upon impact, closes a switch-controlled circuit to actuate a solenoid coil provided with an operating arm connected to the vehicle brake pedal.

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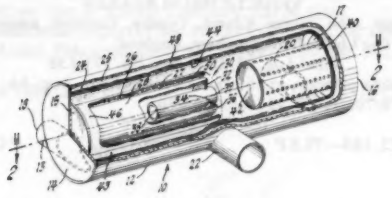
**3,744,589**
**SWIRLING FLOW MUFFLER**

**Robert C. Mellin, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed June 9, 1972, Ser. No. 261,373**
**Int. Cl. F01n 1/10**
**U.S. Cl. 181—58** **3 Claims**



In preferred form, a sound attenuating device receiving internal combustion engine exhaust gases including a closed cylindrical body having tangentially attached inlet and outlet ports providing unbaffled helical flow of the gases through the cylindrical body. A first layer of acoustical material is positioned within said closed cylindrical member in conformance to the interior surface thereof and can be spaced therefrom depending upon the particular material used. A second layer of acoustical material is concentrically disposed about a cylindrical resonator attached to one end of the closed cylindrical body. The second layer of acoustical material substantially conforms to the exterior surface of the resonator and can also be spaced therefrom depending upon the materials used. A perforated cylindrical member having a closed end is attached to the other end of the cylindrical body. The closed end of the perforated cylindrical member extends toward but is spaced from the end of the resonator which extends approximately half the axial length of the closed cylindrical body. Upon entrance into the inlet port, a substantial portion of the sound waves impinge against both layers of acoustical material so that both high frequency and medium frequency sound waves are absorbed by the material as the gases progress through the unbaffled helical flow path to the outlet port. The annulus itself is effective to cancel wavelengths associated with the circumferential distance. In addition, the muffler chamber exhibits lined expansion chamber noise reduction characteristics. This arrangement provides desirable sound attenuating results without creating a substantial pressure drop across the device.

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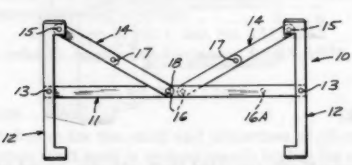
**3,744,590**
**HOME SCAFFOLD**

**Everett J. Pendleton, and Melvin C. Lodge, both of 11550 S. Justine St., Chicago, Ill.**

**Filed Apr. 17, 1972, Ser. No. 244,713**
**Int. Cl. E04g 1/30, 1/34**
**U.S. Cl. 182—152** **1 Claim**

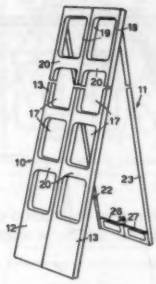


A scaffold in H-frame form combines a telescoping platform and collapsible verticals. Locking means secure the scaffold in two or more telescoped positions.

**3,744,591**
**PORTABLE, FOLDING STEPLADDER**

**Roberto Lucci, Milan, and Paolo Orlandini, All'olmo, both of Italy, assignors to S.p.A. VELCA, Legnano (Milan), Italy**

**Filed Apr. 18, 1972, Ser. No. 245,160**
**Claims priority, application Italy, June 25, 1971, 26250 A/71**
**Int. Cl. E06c 1/383**
**U.S. Cl. 182—156** **5 Claims**



A portable stepladder comprising: a stepladder with a row of steps or treads supported by side posts, and a rear support whose upper end is pivotally connected with the related upper end of the stepladder along a horizontal axis, both said stepladder and said rear support being longitudinally split into two sections hinged with each other and both hinge connections lying in a common plane to allow the stepladder structure to be folded-up into its closed condition.

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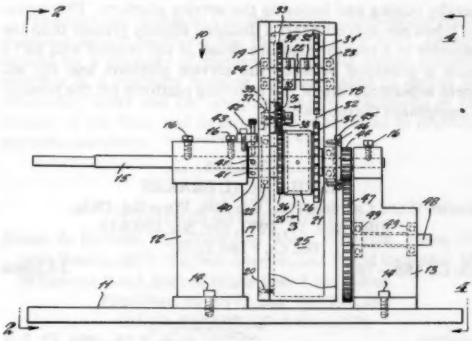
**3,744,592**
**MECHANICAL ROTARY DEVICE**

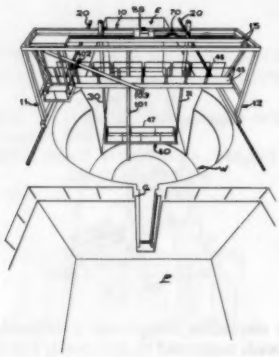
**Albert H. Neuman, 1089 Candlewood Road, Elgin, Ill.**

**Filed Mar. 22, 1972, Ser. No. 236,880**
**Int. Cl. F03g 1/00**
**U.S. Cl. 185—37** **3 Claims**



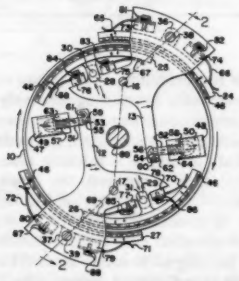
A mechanism for producing a low power output and which is accordingly adaptable for moving relatively light weight objects, the mechanism consisting of a base upon which a pair of spaced apart pedestals are mounted, the pedestals supporting a stationary shaft to which a housing assembly positioned between the pedestals is secured, the housing containing a sprocket mounted freely rotatable on the shaft but being attached thereto by means of spiral leaf spring, the sprocket driving a second sprocket on a spindal mounted on an eccentric part of the housing so to rotate around the shaft, the spindal having a first gear fastened thereto which through an idle gear engages a gear mounted rotatably free on the shaft and which is integral with a cylindrical hub provided with openings there around that are selectively engageable by a pin slidable supported upon the pedestal.

3,744,593
**ELEVATOR FOR A REACTOR WELL AND EQUIPMENT STORAGE AREA**
Cecil R. Jones, San Jose, Calif., assignor to Transfer Systems Incorporated, New York, N.Y.
Filed Apr. 13, 1971, Ser. No. 133,687
Int. Cl. B66b 11/04
U.S. Cl. 187—17 9 Claims



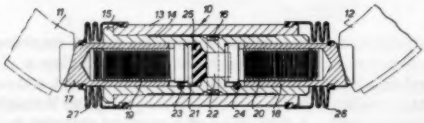
An elevator for a reactor well and an equipment storage area wherein a service platform is raised and lowered within the reactor well and adjoining area for performing operations within the reactor well and the equipment storage area. Toward this end, stationary tubes are suspended in fixed relation from an overhead support. Telescopically received by the stationary tubes are movable, upright tubes. Fixed to the lower ends of the movable tubes for rectilinear movement therewith is the service platform. A lifting and lowering device, such as a cable and drum arrangement or a hydraulically actuated system, is mounted on the overhead support. The cables extend into the stationary tubes and are attached at their free ends to the movable tubes for raising and lowering the same, thereby raising and lowering the service platform. The movable tubes are spaced apart a distance slightly greater than the diameter of a reactor pressure vessel in the reactor well and a space is provided between the service platform and the adjacent superstructure of the refueling platform for the passage of equipment therebetween.

3,744,594
**MECHANICAL BRAKES**
Charles Ward Cashion, P.O. Box 306, Waurika, Okla.
Filed Nov. 17, 1971, Ser. No. 199,610
Int. Cl. F16d 53/00
U.S. Cl. 188—76 3 Claims



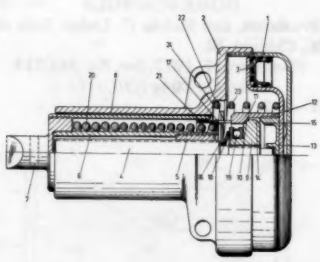
A brake mechanism having pairs of arcuate brake shoes pivotally mounted near the outer end of a pivoted lever to simultaneously engage the inner and outer cylindrical surfaces upon application of power, either mechanical or hydraulic, to the brake lever, so as to grip a cylindrical brake drum to retard the rotation thereof. Provision is made to resiliently balance the brake shoes in a central position out of contact with the cylindrical surfaces of the brake drum. It is preferable to have a pair of such pivoted levers within a brake drum, which are operated independently by hydraulic cylinders, so if one cylinder becomes inoperative, the effectiveness of the other cylinder would not be impaired. The arcuate brake shoes are circumferentially spaced apart to permit a certain degree of self energization and to minimize heat transfer.

3,744,595
**VEHICLE DRUM BRAKES**
William John Pearce Adams, Tyseley, England, assignor to Girling Limited, Birmingham, England
Filed Aug. 12, 1971, Ser. No. 171,135
Claims priority, application Great Britain, Aug. 14, 1970, 39,378/70; Nov. 9, 1970, 53,105/70
Int. Cl. F16d 65/56
U.S. Cl. 188—79.5 P 7 Claims



An abutment assembly for interconnecting the ends of two brake shoes of a vehicle drum brake, the other ends of the shoes being connected to actuating means, comprising an elastically deformable member confined between piston-like portions of two tappets coupled to the respective shoes, these pistons having different areas of engagement with the elastic member so that only a part of the thrust applied to the assembly by one brake shoe is transmitted to the other shoe. The invention provides improved shaping of the elastic member; sealing means between the elastic member and the pistons; means for adjusting the length of the tappets to compensate for wear; and means for effecting such adjustment automatically.

3,744,596
**PNEUMATIC CYLINDER-PISTON UNIT FOR RAILWAY BRAKE RIGGINGS**
Nils Borje Lennart Sander, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden
Filed Dec. 27, 1971, Ser. No. 212,347
Claims priority, application Great Britain, Jan. 12, 1971, 1,346/71
Int. Cl. F16d 65/66
U.S. Cl. 188—203 5 Claims



A pneumatically operated slack adjuster is used on an auxiliary light inexpensive brake pad used along with disc brakes on a railway wheel to clean the surface of the wheel and has two telescopically related displaceable parts, one a spindle

with screw threads and the other a tubular rod with a nut threaded on the spindle with a non-locking pitch. Slack may be taken up in one or both directions when radially extending clutch surfaces are released during a braking stroke or release. The piston actuates an adjuster spring by transmitting a force to the tubular rod.

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**3,744,597**

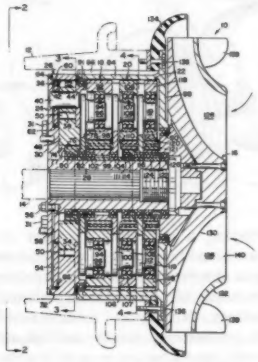
**TURBO-BRAKE HAVING GEAR RATIO CHANGER**

**Richard L. Crossman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Continuation-in-part of Ser. No. 849,994, Aug. 14, 1969, abandoned. This application July 28, 1971, Ser. No. 166,950**

**Int. Cl. F16d** *57/00*

**U.S. Cl. 188—291** **12 Claims**



A drive system for an output member such as a turbo-brake member including an impeller driven by a planetary gear assembly is provided.

A gear ratio changer means including gear pumps is received in a chamber in a case or housing means, and connects to the planetary gear assembly to control the drive gear ratio of the same, and means are associated with said gear ratio changer means for connection to a pressure system to receive pressure therefrom to restrict hydraulic flow in the gear pumps and control the output of said gear ratio changer means.

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**3,744,598**

**INSTALLATION FOR THE UNLOADING OF SHAFT SEALS IN HYDRODYNAMIC BRAKES FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES**

**Hans Hanke, and Friedrich Bultmann, both of Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany**

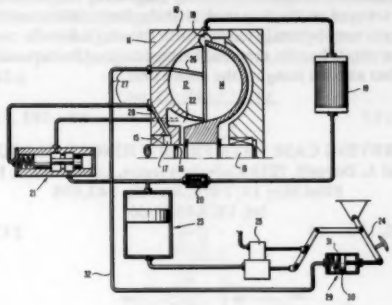
**Filed Apr. 6, 1971, Ser. No. 131,680**

**Claims priority, application Germany, Apr. 8, 1970, P 20 16 711.7**

**Int. Cl. F16d** *57/04*

**U.S. Cl. 188—296** **15 Claims**

An installation for the relief and protection of oil-retaining rings or other shaft seals in hydrodynamic brakes for vehicles, in which at least one fixed blade wheel and one rotating blade wheel are provided in the brake, and in which the working circulatory system is filled with a pressure medium during the actuation of the vehicle brake; the space sealed off by the oil seal is relieved directly in front of the oil seal toward a place of the working circulatory system that becomes pressureless during operation and is also connected with a device opposing actuation of the vehicle brake when the vehicle stands still.



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**3,744,599**

**DOUBLE-ACTING, SHORT-STROKE, LOW-PRESSURE DAMPING DEVICE**

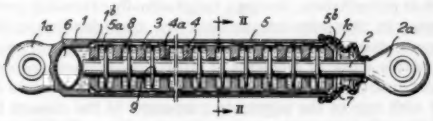
**Charles Henri Tresch, Le Vallon-Eguilles, and Aime Michel Hancart, Marignane, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France**

**Filed Dec. 15, 1971, Ser. No. 208,151**

**Claims priority, application France, Dec. 17, 1970, 7045582**

**Int. Cl. F16f** *9/04*

**U.S. Cl. 188—298** **6 Claims**



The invention relates to a double-acting, short-stroke linear damping device involving the throttling of a fluid, characterized by a plurality of elemental damping means grouped together in a common housing and associated to means for recovering leaks and for compensating for variations in the volume of the fluid, and to means for attachment to mutually movable members.

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**3,744,600**

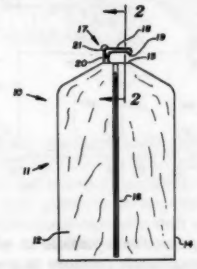
**CLOTHES BAG STRUCTURE**

**James A. Belland, 310 Wildwood Road, Willernie, Minn; Eugene Brown, 2600 Mayfair Avenue, and David Dewuske, 103 Wildwood Road, both of White Bear Lake, Minn.**

**Filed Nov. 19, 1971, Ser. No. 200,354**

**Int. Cl. B65d** *85/18;* **A45c** *13/26*

**U.S. Cl. 190—41 B** **4 Claims**



A clothes bag structure including a garment containing section having a hanger receiving element at the upper end

thereof to receive a plurality of garment hangers and lock the same thereto with the hanger receiving element providing a single handle element extending outwardly of the bag and being secured to the bag such that the bag and the contained garments may be easily carried with the single handle member and the single handle member being designed for not only carrying but also for hanging the entire unit.

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**3,744,601**

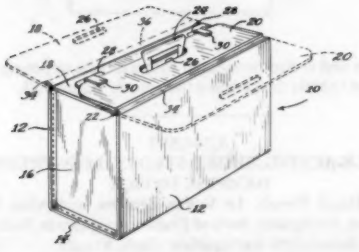
**CARRYING CASE WITH FREELY HINGED CLOSURE**

**Mandel A. Doppelt, 7218 Kedvale Avenue, Lincolnwood, Ill.**

**Filed May 17, 1971, Ser. No. 143,898**

**Int. Cl. A45c 3/00**

**U.S. Cl. 190—48** **2 Claims**



A carrying case with a freely hinged closure or flap wherein the hinge member which connects the closure flap to the side wall of the carrying case is formed of an integrally formed strip of a substantially rigid material, preferably a plastic material such as polyethylene, having a longitudinally extending groove formed in the strip intermediate the opposite longitudinal edges to reduce the thickness of the material along said groove to provide a pair of segments or hinge leaves one on each side of the groove, with the groove forming the hinge or fold line and with one of the segments connected to the closure flap and the other segment connected to the side wall of the case, wherein the closure flaps may be opened at the open end of the bag so as not to interfere with the bag opening and provide a maximum open surface for access into the interior of the bag.

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**3,744,602**

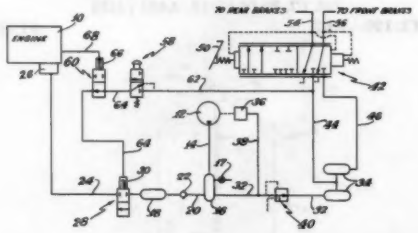
**COMBINED AIR SYSTEM FOR STARTER AND BRAKES**

**Prem L. Ajwani, Lake Zurick, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Oct. 12, 1971, Ser. No. 188,063**

**Int. Cl. B60k 29/02**

**U.S. Cl. 192—3 R** **10 Claims**



A combined air system for a vehicle in which an engine driven compressor supplies air pressure to a pair of separate reservoir means, one for the air actuated brakes and one for the engine air starter. The reservoirs are isolated from each other by check valve means and are charged at different maximum pressures by virtue of a limiting valve. A relay valve controls the air pressure to the engine air starter and is actuated by a starter valve connected to the brake reservoir so that the engine can be started only if there is sufficient air in the brake reservoir for subsequent safe operation of the vehicle.

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**3,744,603**

**POSITIVE CLUTCH AND BRAKE WITH LIMIT SWITCH**

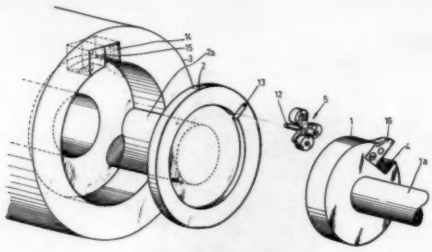
**Jacques Garnier, Le Chesnay, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France**

**Filed June 15, 1971, Ser. No. 153,348**

**Claims priority, application France, June 18, 1970, 7022622**

**Int. Cl. F16d 67/02**

**U.S. Cl. 192—16** **14 Claims**



Device for stopping a moveable member at a position defined with accuracy with respect to an adjacent stationary element carrying a stopping member, comprising the combination of recess means in said stationary element and in an intermediary element driving in motion said moveable member through connection means and clenching means cooperating with said recess means so as to interlock said connecting means and said intermediary element until the recess means thereof registers with the recess means of said stationary element and to interlock said stationary element with said connecting means while disconnecting the latter from said intermediary element, at the time when said recess means register, thereby resulting in the stopping of said connection means at an accurately defined position, and in the corresponding stopping of the moveable member driven in motion therewith.

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**3,744,604**

**SYNCHRONOUS DEVICE FOR CHANGE-SPEED GEARS, ESPECIALLY FOR MOTOR VEHICLES**

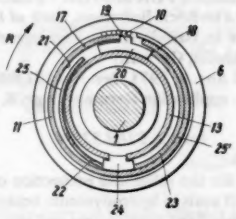
**Jorg Austen, Weinsberg, Germany, assignor to Firma Dr.-Ing. h. c. F. Porsche KG, Stuttgart-Zuffenhausen, Germany**

**Filed Dec. 21, 1970, Ser. No. 100,172**

**Claims priority, application Germany, Dec. 19, 1969, P 19 63 701.5**

**Int. Cl. F16d 13/00**

**U.S. Cl. 192—53 C** **9 Claims**



A synchronous device for change-speed gears, especially for motor vehicles, wherein slotted correcting rings are under the

influence of locking members for increasing the servo effect. During the synchronizing operation, the locking or arresting members are brought into pre-tensioned contact onto the correcting rings between sliding or shiftable stops. The inner surface of the correcting rings and/or the surfaces of the locking members operatively cooperating therewith are provided, at least in part, with a friction layer comprising a thin-walled coating of high friction coefficient material such as copper, titanium, molybdenum or the like.

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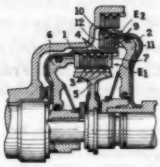
**3,744,605**

## CLUTCH OR BRAKE DEVICE FOR AN AUTOMATIC TRANSMISSION

**Jean Piret, Bougival, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, both of France**

**Filed Oct. 12, 1971, Ser. No. 188,220**
**Claims priority, application France, Nov. 4, 1970, 7039716**
**Int. Cl. F16d *13/52, 13/68***
**U.S. Cl. 192—70.2** **6 Claims**



Clutch or brake device for an automatic transmission comprising a support element such as a clutch drum having a cylindrical wall having splines and a clutch reaction plate carried by the support element. Localized welds fix the periphery of the plate to the splines of the support element.

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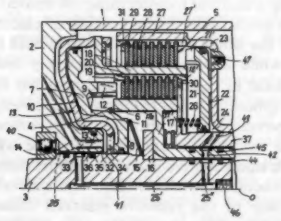
**3,744,606**

## DUAL HYDRAULIC OR PNEUMATIC COUPLING

**Manfred Bucksch, Friedrichshafen, Germany, assignor to ZF-Borg Warner GmbH, Saarbrucken, Germany**

**Filed May 15, 1972, Ser. No. 253,441**
**Claims priority, application Germany, May 25, 1971, P 21 25 861.7**
**Int. Cl. F16d *25/10***
**U.S. Cl. 192—87.11** **10 Claims**



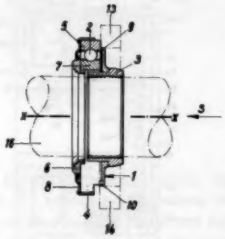
Two nested hydraulic or pneumatic couplings, such as a pair of clutches or a clutch and a brake, have interleaved inner and outer annular friction foils carried on three coaxial sleeves. The middle sleeve is rigid with a fluid cylinder welded onto a central shaft on which the inner sleeve is freely rotatable, a portion of the cylinder wall being axially inbent into an annular clearance separating the inner sleeve from the shaft. The cylinder, open toward the foil assemblies, encloses a piston of re-entrant cross-section, roughly matching that of the cylinder wall, which controls the inner foil assembly while extending into the region of the outer foil assembly so that its effective area substantially equals that of a second piston in a confronting fluid cylinder controlling the outer foil assembly.

**3,744,607**

## DISENGAGING BEARING FOR CLUTCHES

**Otto Hausinger, Gerlingen, Germany, assignor to Dr.-Ing h. c. F. Porsche KG, Stuttgart-Zuffenhausen, Germany**

**Filed June 22, 1971, Ser. No. 155,491**
**Claims priority, application Germany, June 26, 1970, P 20 31 582.6**
**Int. Cl. F16d *23/14***
**U.S. Cl. 192—98** **15 Claims**



A release bearing for clutches, especially for friction clutches of motor vehicles, in which a housing equipped with a roller bearing and actuated by means of a release member is so constructed that during the disengagement of the clutch, the release member engages in the housing and comes into abutment directly on a race of the roller bearing.

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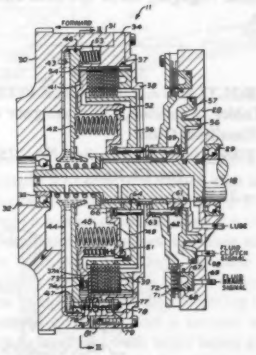
**3,744,608**

## CENTRIFUGALLY AND SPRING ENGAGED CLUTCH

**Harry B. Newman, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Mar. 1, 1972, Ser. No. 230,854**
**Int. Cl. F16d *23/10***
**U.S. Cl. 192—105 A** **5 Claims**



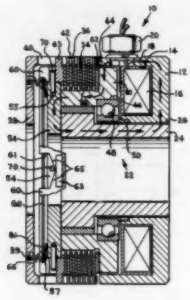
A self modulating clutch transmits drive from an engine to a transmission of the form having ratio gears which are momentarily braked to a stationary condition to facilitate shifting. Springs exert a light pressure on the clutch plates prior to re-engagement at the conclusion of a shift whereby the gears are briefly rotated by a relatively low torque prior to the re-application of full engine torque by re-engagement of the clutch. This rollover of the ratio gears assures that the selected gear engagements take place reliably and without severe wear or damage.

**3,744,609**

## SELF-ADJUSTING TWO-WAY ELECTROMAGNETIC DISC CLUTCH

**Donald L. Miller, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Mar. 31, 1971, Ser. No. 129,741**
**Int. Cl. F16d** *13/60*
**U.S. Cl. 192—111 A** **7 Claims**



A two-way electromagnetic clutch with wear compensating means operative in either direction of rotation having two sets of coacting friction discs adapted for releasably coupling a driving and driven rotary component. When the clutch is energized, the armature, which is not in the drive train, contactively engages with the pole faces of the electromagnet causing the freely mounted armature to rotate with the driving member. An annular pressure plate member which is slidably splined to the driven rotary component and slidably mounted to the armature by suitable cam means for relative axial and rotational movement therewith, applies the necessary engagement pressure to the friction disc assembly causing torque to be transmitted from the driving to the driven rotary component. The pressure plate has symetrical V-shaped recesses therein which coact with cam-like projections of the armature to automatically take up any lost motion occasioned by wear of the friction discs for either direction of rotation of the clutch; thus, the desired disc engagement pressure and the electromagnetic engaging force are held constant for the life of the clutch.

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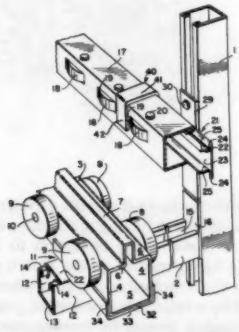
**3,744,610**

## BOLTLESS ADJUSTABLE FITTING

**Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio**

**Filed Aug. 27, 1971, Ser. No. 175,636**
**Int. Cl. B65g** *13/00*
**U.S. Cl. 193—35 R** **6 Claims**



In a material handling system a snap-on, boltless adjustable connector or fitting is employed, which includes a one piece connector symmetrical about a plane and provided on opposed sides with S-shaped and the mirror image of S-shaped spring clips for engaging opposed flanges of construction channel members, and suitable means for connecting the one piece connector to another construction member. These means may be an identical one piece connector at right angles to and facing away from the first one piece connector, a plate rigidly connected to the first one piece connector and pivotally connected to a construction member, or a U-shaped channel member connected at right angles to and facing away from the one piece connector so that the opposed legs of the U-shaped channel member may frictionally engage a construction member. The S-and mirror image of S-shaped spring clips are so formed in relation to the flanges they engage that a first portion will wrap around the entire adjacent flange, and that a second portion will present a cam surface for resiliently distorting the clips away from their respective flanges during assembly and after full assembly snap behind the respective flanges, with respect to the direction of entry, to provide a secure connection.

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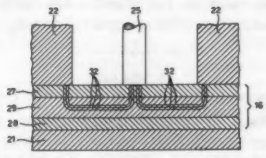
**3,744,611**

## ELECTRO-THERMIC PRINTING DEVICE

**Lucio Montanari, Cascinette, and Franco Knirsch, Pavone, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy**

**Filed Jan. 8, 1971, Ser. No. 104,893**
**Claims priority, application Italy, Jan. 9, 1970, 67046 A/70**
**Int. Cl. H05b** *1/00*; **G01d** *15/10*
**U.S. Cl. 197—1 R** **5 Claims**



An electrothermal printer for non-impact printing on plain paper which makes use of a ribbon which is made up of a substrate having a thermal transferrable ink coated on the surface towards the plain paper and a coating of electrically resistive material on the other side. The ribbon is held in contact with the paper while a plurality of selectively energizable electrodes are held in contact with the resistive material coated side of the ribbon. The electrodes are selectively energized for causing a current to pass through an incremental portion of the resistive material to another electrode which is held in contact with said resistive material a short distance from said selectively energizable electrodes. The current in the incremental portion of the resistive material causes enough $I^2R$ heating to soften the wax coated on the substrate directly opposite to the heated portion. The softened ink transfers to the plain paper sheet as a dot or a line.

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**3,744,612**

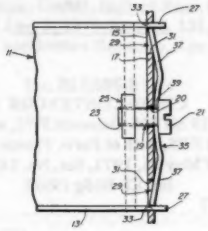
## KEY LEVER MOUNTING ARRANGEMENT

**Heinz Geis, Frankfurt/Main, Germany, assignor to Adlerwerke vorm. Heinrich Kleyer Aktiengesellschaft, Nuernberg, Germany**

**Filed May 9, 1972, Ser. No. 251,741**
**Int. Cl. B41j** *5/08*
**U.S. Cl. 197—98** **2 Claims**

A typewriter key lever bearing is rigidly secured to a wall by forming tabs on the end of the bearing which are received in

slots formed in the wall and pressed thereagainst by the flexing of a resilient mounting plate in response to the tightening of a



clamping device pressing both the mounting plate and the key lever bearing against the wall.

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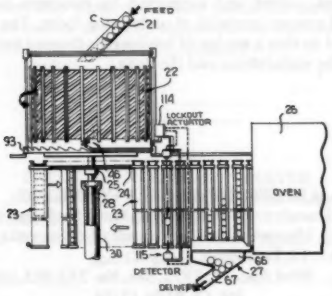
**3,744,613**
**TRANSFER ASSEMBLY**

**Ben E. Werner, Golden, and Richard D. Setty, Lakewood, both of Colo., assignors to UR Industries, Inc., Cheyenne, Colo.**

**Division of Ser. No. 44,515, June 8, 1970, Pat. No. 3,669,308.**
**This application Apr. 12, 1972, Ser. No. 243,283**
**Int. Cl. B65g** *29/00, 47/06*
**U.S. Cl. 198—25** **3 Claims**




This disclosure relates to a transfer assembly for automatically transferring or distributing a continuous supply of members from a main source into a plurality of carriers. The transfer assembly includes a continuously rotating drum loader having storage chutes spaced about the periphery thereof for continuously receiving members. The carriers into which members are to be distributed are mounted so that they pass around the axis of rotation of the drum loader in unison therewith and in alignment with lower ends of the chutes. Each chute is provided with a gate at its lower end and means are provided for serially operating the gates to dispense a predetermined number of members into each carrier. Each carrier is also provided with escapement mechanisms which repeatedly dissipate the energy of the falling members received therein and which also serve to space vertically adjacent members within a carrier.

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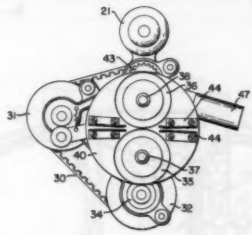
**3,744,614**
**ROTATING MECHANISM**

**Kenneth L. Shooter, Senecaville; Richard E. Cone, and Steve E. Bajtosh, both of Cambridge, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio**

**Filed June 30, 1972, Ser. No. 268,034**
**Int. Cl. B65g** *47/24*
**U.S. Cl. 198—33 AB** **14 Claims**

A mechanism for positioning a record member on a platform, rotating the platform 180° and then removing the record member from the platform is disclosed. Included in the mechanism is a pair of drive rolls mounted on a rotatably mounted platform which engages and positions a record member on the platform. The platform is then rotated during which movement the drive rolls are disabled. Upon reaching a



180° rotation of the platform, the drive rolls are again operated to remove the record member from the platform. A stationary drive member positioned adjacent the platform will alternately engage each drive roll upon the positioning of the platform in a horizontal plane.

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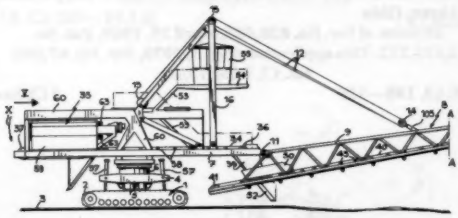
**3,744,615**
**INSTALLATION FOR THE EVACUATION OF ROCKS FROM A WORKING TO A CONTINUOUS TRANSPORTER**

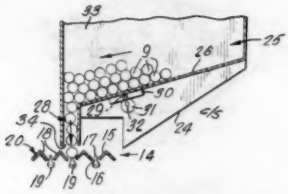
**Jacques Jules Plaquet, Chateau de Vaulx, 7520 Vaulx, and Raymond Gerard Van Swieten, Dreve du Prince, 7504 Rumillies, both of Belgium**

**Filed Sept. 22, 1971, Ser. No. 182,644**
**Claims priority, application Belgium, Sept. 25, 1970, 94,358/70**
**Int. Cl. B65g** *65/28*
**U.S. Cl. 198—36** **7 Claims**



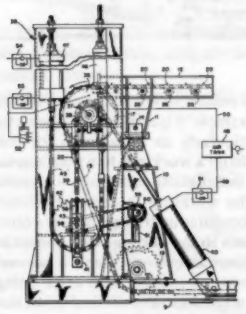
The invention relates to the removal of rocks or stones from workings, for example a quarry or an open-cast mine. It concerns more particularly an installation for the evacuation of rocks or stones from a workings to a continuous transporter or conveyor. This installation comprises a chassis movable over the ground of the workings, a carriage movable on a rolling path along the continuous transporter or conveyor, a jib connecting the chassis to the carriage and consisting of a first arm carrying a continuous conveyor and a second arm carrying another continuous conveyor, both arms being articulated to one another on a substantially vertical pivot suspended from a structure which is supported by the chassis or by the carriage. The first arm of the jib is articulated to the chassis on a substantially vertical pivot, and the second arm is articulated to the carriage round another vertical pivot which comprises a trunnion rotatably mounted in a bearing round a substantially vertical axis, the trunnion being articulated to the end of the second arm round an axis which is substantially horizontal and substantially transverse to the conveyor of the second arm, and the bearing being articulated to the carriage round an axis which is substantially horizontal and substantially transverse to the continuous transporter or conveyor, said horizontal axes being situated substantially in the same plane.

3,744,616
AUTOMATIC COLLATOR
Gaetan Alexandre Guillemette, Montreal, Quebec, Canada, assignor to Perkins Papers Ltd., Laval, Quebec, Canada
Filed June 18, 1971, Ser. No. 154,419
Int. Cl. B65g 47/18
U.S. Cl. 198—56 10 Claims



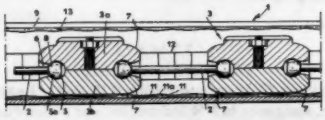
An automatic collator for handling elongated rod like articles and which comprises a plurality of storage means having elongated rod like articles therein and adapted to feed the articles in sequence on an associated guide channel of a conveyor platform. Means are further provided for engaging and conveying the articles along a portion of the guide channels. Discharge meaans discharge the articles longitudinally in a predetermined side-by-side relationship from the conveyor platform.

3,744,617
THERMOFORMING APPARATUS
Albert Herbener, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio
Division of Ser. No. 820,098, April 29, 1969, Pat. No. 3,632,272. This application Aug. 3, 1970, Ser. No. 67,660
Int. Cl. B65g 15/00
U.S. Cl. 198—135 4 Claims



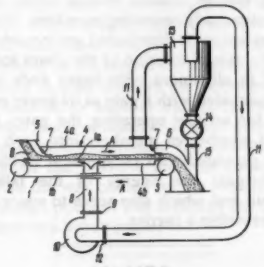
Thermoforming apparatus including an oven, a thermoformer adjacent to the oven, and a sheet conveyor operative to successively index a plastic sheet gripped thereby into the oven for heating of the sheet to forming temperature and from the oven into the thermoformer whereat the heated sheet is formed in a mold in the thermoformer, the conveyor being driven by 180° rotation of a drive crank to achieve a sinusoidal speed curve for gradual acceleration of the conveyor and sheet from zero speed and gradual deceleration of the conveyor and sheet to zero speed in the stepwise transport of the sheet into and from the oven and into and from the thermoformer.

3,744,618
CHAIN CONVEYORS
Maxime Monne, 19 bis Bld. Delessert F 75, and Michel Eudier, 3 rue Andrieux F 75, both of Paris, France
Filed May 26, 1971, Ser. No. 147,144
Int. Cl. B65g 19/00
U.S. Cl. 198—177 6 Claims



A chain conveyor comprises links connected for universal flexure and guided and supported by structure faced with lubricated porous material of undulating form. The links are chamfered so that a wedge of lubricant is formed between the crests of the undulations and the links.

3,744,619
AIR CUSHIONED BELT CONVEYOR
Anatoly Alexandrovich Dolgolenko; Pavel Pavlovich Onokhov, and Jury Meerovich Makhover, all of 8 Sovetskaya ulitsa, 17/19, kv. 16, Leningrad, U.S.S.R.
Filed Apr. 11, 1972, Ser. No. 242,953
Int. Cl. B65g 15/28
U.S. Cl. 198—184 3 Claims



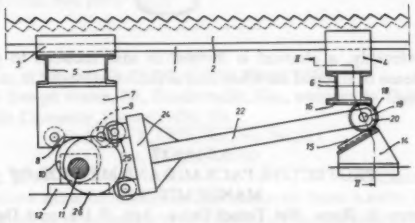
The conveyer comprises a flexible belt whose load side is confined in a trough which is made closed at its top and ends, and is connected at its bottom to the pressure port of a fan, and at its top, in the place where the material is discharged, to the suction port of said fan, thus preventing the upper layer of the conveyed dusty material from being blown off.

3,744,620

## DRIVE FOR THE MOVABLE GRATE OF A TRANSVERSE FEEDING INSTALLATION FOR ROLLED STOCK

Otto Karl Buchheit, Ingbert-Saar, Germany, assignor to Moeller & Neumann GmbH, Ingbert-Saar, Germany

Filed Apr. 5, 1971, Ser. No. 131,118
Claims priority, application Germany, Apr. 4, 1970, P 20 16 248.5
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 3 Claims



A drive for producing an oscillating movement during the vertical stroke of a cooling bed support grate for rolled stock which is movably supported in the horizontal direction by a plurality of rollers (18, 20) supported on inclined surfaces (15) and driven in an oscillating motion.

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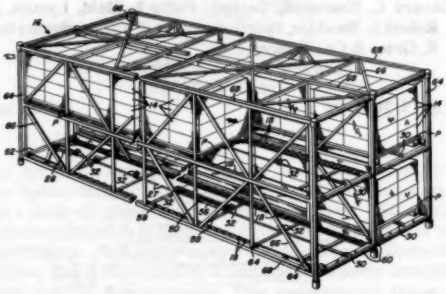
3,744,621

## PALLET HANDLING APPARATUS

Lowell K. Adams, Route 2, Box 136, and Mike Schump, 3505 Seeley Court, both of Greeley, Colo.

Filed Oct. 18, 1971, Ser. No. 190,127
Int. Cl. B65g *25/08*
U.S. Cl. 298—221 29 Claims



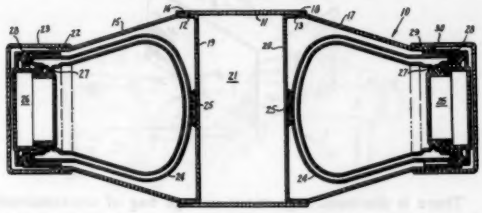
Pallets of the type conveyed by fork lifts are lodged successively within a frame-like structure and stored or accumulated therein until removed by fork lifts later; the structure being provided with pneumatic means at its entry and delivery ends, for automatically advancing and positioning pallets at the delivery end for quick and easy removal, irrespective of the rate or frequency of pallet delivery to the entry end of the frame structure.

3,744,622

## LUNCH KIT

Earl Wilson Weaver, McIntosh, Ala., assignor to John D. Woodyard, Calvert and Sam D. Weaver, McIntosh, both of Ala., part interest to each

Filed May 3, 1971, Ser. No. 139,783
Int. Cl. A45c *11/20*
U.S. Cl. 206—4 4 Claims



A lunch kit including a pair of wide mouth insulated bottles connected through a central compartment for dry food with the heat from the insulated bottles keeping the dry food warm.

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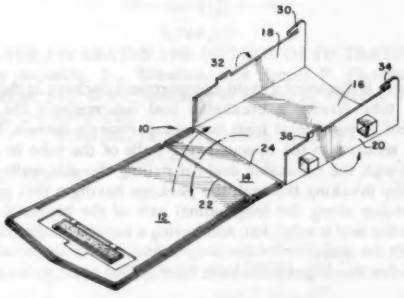
3,744,623

## SELF-LOCKING CADDY WITH UNIQUE SUSPENSION MEANS

Cecil B. Woofter, Newton, Iowa, assignor to The Vernon Company, Newton, Iowa

Filed Mar. 14, 1972, Ser. No. 234,480
Int. Cl. B60n *3/08*; B65d *7/26*
U.S. Cl. 206—19.5 R 8 Claims



A plastic, integrally formed caddy comprising a rear panel, a base, a front panel, a pair of side panels, and hinge lines for joining the panels and the base together. Channels on the base and the rear panel seat the edges of the side panels for proper alignment therebetween. Locking tabs and guiding tabs at the free ends of the side panels fit into slots in the rear panel to hold the caddy in erected position. One side panel has two spaced projections for holding a writing implement.

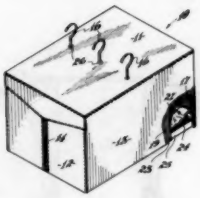
Suspension means are integrally formed within a recess in the rear panel of the caddy. After the caddy has been erected, the suspension means are severed from the rear panel and are secured to a flat surface. The caddy is then engaged with, and suspended from, said suspension means.

**3,744,624**

## GARMENT STORAGE BAG DISPLAY

**Edmund F. Dunne, Yonkers, N.Y., assignor to Clopay Corporation, Cincinnati, Ohio**

**Filed Sept. 15, 1971, Ser. No. 180,717**
**Int. Cl. B65d** *5/36, 85/18*
**U.S. Cl. 206—44 R** **4 Claims**



There is disclosed a garment storage bag of conventional design, that is adapted to be packaged for sale in flat folded condition, in combination with a device to set up the bag for display purposes to show prospective purchasers the appearance of the bag in use.

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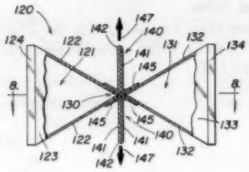
**3,744,625**

## MULTI-COMPARTMENT MIXING PACKAGE

**Free W. Chin, 3554 N. Central Avenue, Chicago, Ill.**

**Filed Jan. 27, 1971, Ser. No. 110,060**
**Int. Cl. B65d** *79/00*
**U.S. Cl. 206—47 A** **4 Claims**



There is disclosed a multi-compartment package in the form of a tube having a breakable seal intermediate the ends thereof to provide at least two compartments therein, finger pulls secured to the opposed side walls of the tube in alignment with the breakable seal for pulling the side walls apart thereby breaking the seal, the package having a first greater dimension along the longitudinal axis of the breakable seal when the seal is unbroken and having a second smaller dimension in the direction of the longitudinal axis of the breakable seal after the finger pulls have been pulled apart to break the seal.

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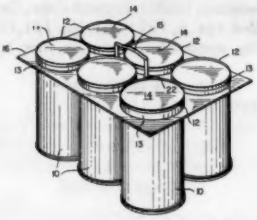
**3,744,626**

## PLASTIC CARRIER PACKAGE

**Robert L. Dreyfus, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.**

**Filed Aug. 27, 1971, Ser. No. 175,534**
**Int. Cl. B65d** *85/62*
**U.S. Cl. 206—65 C** **9 Claims**

This invention comprises a carrier for transporting a plurality of regularly shaped articles in a package or "pack." The carrier-package comprises an unoriented thermoplastic web having complementary sections thermoformed therein for over-laying the shaped article and interengaging the side of the shaped article to maintain the article in a configuration convenient for transporting. The thermoplastic web material in the complementary sections is oriented by the forming process and can be shrunk tightly around the article.



Preferably, a channel is formed in said sections to permit release of trapped air when said articles are placed in said sections.

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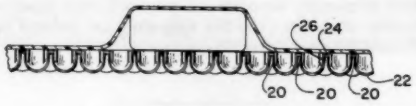
**3,744,627**

## PROTECTIVE PACKAGE AND METHOD OF MANUFACTURE

**Barry S. Rope, 904 Teasel Drive, Apt. F 1-1, and David E. Stooksbury, 4317 Beechcliff Drive, both of Kingsport, Tenn.**

**Filed June 1, 1970, Ser. No. 42,108**
**Int. Cl. B65d** *73/00*
**U.S. Cl. 206—80 A** **2 Claims**



An improved package and method of manufacturing the package in which an article is placed on a plastic cushioning substrate and a second thermoplastic sheet is laminated to the cushioning substrate to enclose the article. The cushioning substrate is of a special design to give it the ability to absorb impact. The cushioning substrate may be provided with a recessed area to accept the article.

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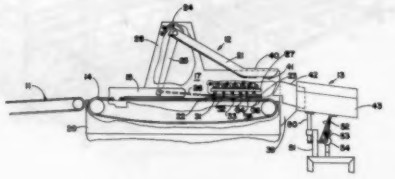
**3,744,628**

## CLASSIFYING METHOD AND APPARATUS

**Edward L. Holcombe, Taylors; Philip L. Reid, Lyman, and Robert S. Hawkins, Spartanburg, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.**

**Filed Feb. 1, 1971, Ser. No. 111,249**
**Int. Cl. B07c** *5/06*
**U.S. Cl. 209—90** **7 Claims**



A method of classifying poultry by measuring the back to keel bone distance thereof and indexing according to different measured distances using a deflectible paddle sensor deflected by the poultry moving thereunder on a conveyor and apparatus suitable for performing such method and including an air sequencing switch controlling two reversing air valves in response to the sensed deflection of the paddle to open a powered circuit for moving a classifying chute.

3,744,629

## FLOTATION OF SILICA

Robert E. Baarson, deceased, late of LaGrange, Ill., and by W. Richard Impey, administrator, LaGrange, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed May 18, 1971, Ser. No. 144,663
Int. Cl. B03d *1/02*
U.S. Cl. 209—166 9 Claims

Acid salts of a mixture of normal-alkyl primary amines having 5 to 12 successive chain lengths including both odd and even numbered carbon chains of 8 to 22 carbon atoms, the major proportion of the constituents being near the center of the chain length range, are used as collectors in the flotation of silica from iron ores.

3,744,630

## KAOLIN FLOTATION PROCESS

Samuel Joseph Smith, III, Sandersville, Ga., assignor to Thiele Kaolin Company, Sandersville, Ga.

Filed Nov. 2, 1970, Ser. No. 86,341
Int. Cl. B03d *1/02*
U.S. Cl. 209—166 15 Claims

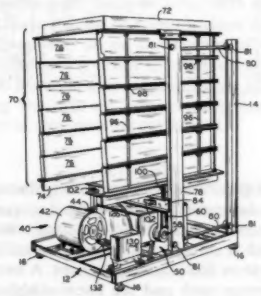
Titanium mineral impurities are removed from Kaolin by forming an acidic dispersion of Kaolin, water and dispersing agent (acidic relative to the flotation pH), adding a collector to the dispersion, conditioning the acidic dispersion, raising the pH by the addition of reagent to the dispersion, subjecting the dispersion to a froth flotation step and recovering the Kaolin having a reduced titanium mineral impurity content.

3,744,631

## RECIPROCATING SIEVE SHAKER APPARATUS

Robert H. Smith, Columbus; Burl D. Tonjes, Malinta, and Charles B. Leader, Napoleon, all of Ohio, assignors to Gilson Screen Company, Malinta, Ohio

Filed Oct. 26, 1970, Ser. No. 83,842
Int. Cl. B07b *1/28, 1/42, 1/46*
U.S. Cl. 209—319 18 Claims



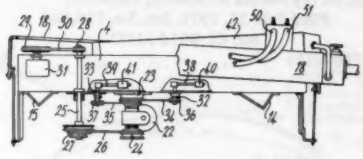
An apparatus having one or more removable tiered sieve trays hydraulically clamped between sub-frames suspended from a vertically vibratory or reciprocating frame. This clamping means comprises a piston and cylinder at the bottom of the reciprocatory frame to push the sub-frames upwardly together, and is controlled by a foot operated pump mounted in the base of the apparatus. This reciprocatory frame is suspended on a base frame by a plurality of horizontally extending parallel arm or guide rods and is vibrated by eccentric drive means mounted in the base of the base frame beneath the reciprocating frame. The ends of the guide rods may be provided with resilient bushings; and resilient guide rolls may be disposed between the reciprocating frame and a housing part of the base frame for transverse stability. The eccentric drive means may be controlled by a timer and comprises a pair of oppositely rotating parallel shafts having eccentric weights angularly adjustable thereon to counteract the vertical vibrations of the reciprocatory frame and parts attached thereto.

3,744,632

## RECIPROCATING BELT STRATIFIER

Richard Henry Mozley, Walberton, near Arundel, England, assignor to National Research Development Corporation, London, England

Filed Dec. 3, 1970, Ser. No. 94,751
Claims priority, application Great Britain, Dec. 5, 1969, 57,664/69; Mar. 11, 1970, 11,692/70; Mar. 11, 1970, 11,693/70
Int. Cl. B03b *3/00*
U.S. Cl. 209—433 31 Claims



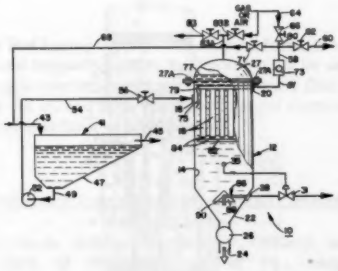
Apparatus for the treatment of ores and other solid materials containing fractions of different density comprises a conveyor surface for conveying a suspension of the material upwardly against a downward flow of wash liquid, and shaking means for imparting a shaking motion to the surface to facilitate separation of the fractions contained in the material. In different embodiments, the apparatus comprises (a) washing means for supplying wash liquid to the surface in a dropwise fashion from above the surface at a series of positions spaced across the surface transversely to the direction in which the material is conveyed by the surface, (b) means for feeding the material on to the surface along each of those two sides thereof which are disposed in the general direction in which the material is conveyed by the surface (c) means for imparting a first orbital shaking motion to the surface to facilitate the initial separation of the fractions contained in the material and means for imparting a second orbital shaking motion to the surface of higher amplitude and/or lower frequency than the first to facilitate discharge of the lighter fractions from the surface.

3,744,633

## FILTER APPARATUS AND METHOD OF FILTRATION

Henry Schmidt, Jr., Hinsdale, and James F. Zievers, La Grange, both of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jan. 18, 1971, Ser. No. 107,308
Int. Cl. B01d *29/38*
U.S. Cl. 210—82 4 Claims



A system for filtering thick liquids includes a filter tank having a relatively tall filter chamber and a plurality of filter elements mounted in the upper portion of the chamber. Filter cake built up on the filter elements is dislodged from all of the

filter elements simultaneously for cleaning purposes, whereby the dislodged filter cake falls to the lower portion of the chamber and is removed from a discharge port at the lower portion of the chamber. A density detector controls a valve for the discharge port so that when the density of the liquid in the tank increases beyond a predetermined level, the discharge port is automatically opened, and then automatically closed when the density falls below a predetermined level.

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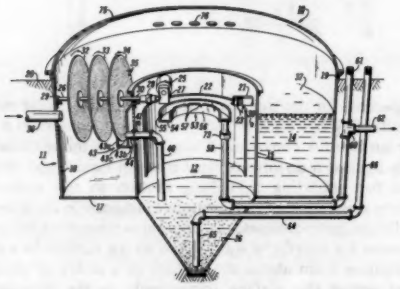
**3,744,634**
**PACKAGE SEWAGE TREATMENT PLANT**
**Harry E. Schlenz, deceased, late of West County Line Rd., Barrington, Ill. (by Norma A. Schlenz, executrix)**
**Filed Feb. 25, 1971, Ser. No. 118,865**
**Int. Cl. B01d *21/02***
**U.S. Cl. 210—151** **3 Claims**



The self-contained package plant includes an annular aerobic, biological treating channel into which the raw sewage is fed and continually driven around the channel by a plurality of rotating perforated discs which also function to aerate and agitate the contents of the channel. A central, sludge tank is located within the space defined by the channel, and controlled recirculation of activated liquid from the settling tank to the annular channel is effected by one of the discs. The clarified effluent from the settling tank is taken from a weir trough adjustably mounted in the upper portion of the sludge tank.

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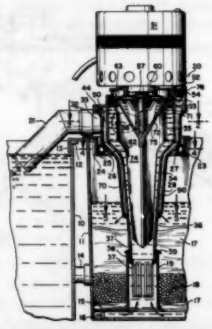
**3,744,635**
**PUMP FOR AQUARIUM FILTER TANKS**
**Tibor Horvath, 1877 East 27th Street, Brooklyn, N.Y.**
**Filed Mar. 28, 1972, Ser. No. 238,799**
**Int. Cl. E04h *3/16***
**U.S. Cl. 210—169** **10 Claims**



An aquarium filter pump which draws water from below filter material in a filter tank and returns it to an aquarium has a vertical pump casing conforming to an elongated impeller having a smaller lower end and a larger upper end above the top of the filter tank, the smaller lower end priming the upper end for more efficient pumping action. The pump motor is mounted on top of the casing and has a shaft extending down into it on which the impeller is mounted. The upper end of the impeller is formed as an inverted conical boss containing blades which throw water away from the shaft entrance. The shaft entrance into the casing has an adjustable seal admitting air for selective aeration. The casing has relatively rotatable inner and outer casings closed at the top and open at the bottom with a clearance therebetween. The outlet tube on the outer casing slides over an outlet opening in the inner casing so that relative rotation of the casings directs selected proportions of pumped water through the outlet tube and between the casings for recirculation back into the filter tank.

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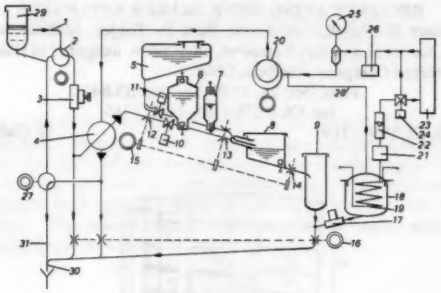
**3,744,636**
**DIALYSIS LIQUID MONITORING AND GENERATING ASSEMBLY**
**Roger Commarmot, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France**
**Filed Jan. 5, 1972, Ser. No. 215,602**
**Claims priority, application France, Jan. 6, 1971, 7100247**
**Int. Cl. B01d *31/00***
**U.S. Cl. 210—180** **6 Claims**



Apparatus for generating and controlling the supply of dialysis liquid to a haemodialyzer comprises sources of dialysis liquid concentrate and water and a metering vessel for each, a mixing tank and a storage tank interconnected by flexible pipelines with valves and pinching devices. A heating vessel is between the storage tank and the haemodialyzer and a gas-bubble line runs from the top of the heating vessel direct to the pump by-passing the dialyzer. A part of the system including a temporary storage buffer tank may be formed into a smaller circuit for sterilization purposes.

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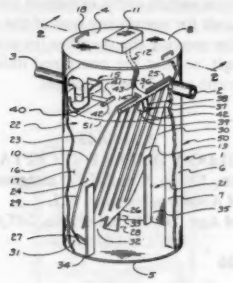
**3,744,637**
**BAFFLE WASTE TREATMENT TANK**
**Leon M. Ziegler, No. 3 McNulty Drive, Manchester, Mo.**
**Filed Mar. 17, 1971, Ser. No. 125,278**
**Int. Cl. C02c *1/12***
**U.S. Cl. 210—195** **10 Claims**

A waste treatment tank has a single baffle dividing an enclosure into a lower aeration compartment and an upper clarification compartment. A blower supplies air to both an aeration air system and a floating waste recycle system. The baffle has openings along its top and bottom permitting controlled com-

munication between aeration and clarification compartments. The aeration air system operates so as to create a circulatory



effect in the aeration compartment causing raw sewage to circulate upwardly along a bottom surface of the baffle.

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**3,744,638**
**OIL MOP AND METHOD OF USING SAME**
**Herbert M. Rhodes, 5419 Pratt Drive, New Orleans, La.**
**Continuation-in-part of Ser. No. 52,448, July 6, 1970, Pat. No. 3,668,118. This application Apr. 13, 1971, Ser. No. 133,580**
**Int. Cl. E02b *15/04***
**U.S. Cl. 210—242** **3 Claims**

The present disclosure is directed to a method of removing oil from the surface of a body of water with an oil mop made of thin gauge narrow strips of polypropylene or similar material passed through the oil on the surface of water and then through wringers and/or water or chemical sprays or both to remove the oil from the mop, depositing the oil in a receptacle and returning the non-oil ladened mop back into the oil covered water to pick up more surface oil.

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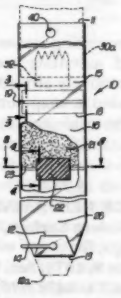
**3,744,639**
**PORTABLE WATER PURIFIER**
**Gifford H. Teeple, Jr., 720 26th St., Manhattan Beach, Calif., and James W. Welsh, 776 North First Avenue, Logan, Utah**
**Filed Mar. 16, 1971, Ser. No. 124,714**
**Int. Cl. B01d *23/00***
**U.S. Cl. 210—265** **9 Claims**



A filter assembly comprises a substantially flat, foldable container having a liquid inlet and a liquid outlet; and, particulate filtering media in the path of liquid flow in the container between the inlet and outlet. The container may define an elongated duct, with flexible flow regulator means therein to control flow through multiple compartments.

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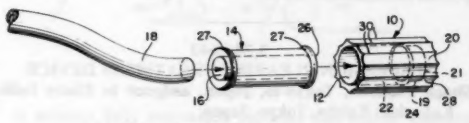
**3,744,640**
**LABORATORY INTAKE FILTER**
**Douglas U. Grover, College Park, Ga., assignor to Glasrock Products, Inc., Atlanta, Ga.**
**Filed Nov. 17, 1971, Ser. No. 199,446**
**Int. Cl. B01d *35/00***
**U.S. Cl. 210—463** **14 Claims**



Intake filter device for use in laboratory liquid reagent bottles. The filter device includes a porous plastic filter element having a central cavity formed from a central bore which is closed at one end and a second bore with a diameter larger and shorter than the diameter of the first bore to receive a tubular glass insert. The tubular glass insert functions to anchor the filter element and prevent filtration through the entire surface of the porous filter element in contact with the liquid reagent.

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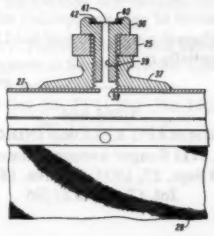
**3,744,641**
**AIR VENTED FILTER LEAF**
**Henry Schmidt, Jr., Hinsdale, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.**
**Filed July 22, 1971, Ser. No. 165,255**
**Int. Cl. B01d *39/00***
**U.S. Cl. 210—486** **7 Claims**



A filter leaf having a peripheral channel frame is secured to an overhead support member by a bolt having an air passage therethrough covered at the top by a perforate filter material to permit the escape of air from the channel frame when the filter chamber is filled with liquid.

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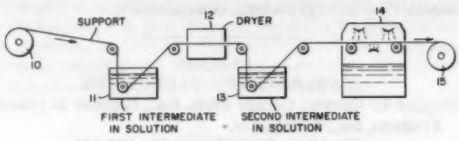
**3,744,642**
**INTERFACE CONDENSATION DESALINATION MEMBRANES**
**Luciano C. Scala, Murrysville; David F. Ciliberti, and Daniel Berg, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**
**Filed Dec. 30, 1970, Ser. No. 102,620**
**Int. Cl. B01d *31/00***
**U.S. Cl. 210—500** **19 Claims**

A desalination membrane-substrate composite, effective to permit the effusion of pure water and the rejection of dis-

solved impurities, comprising a semipermeable membrane layer of polymeric material in contact with at least one side of




a porous substrate is made by in-situ interfacial condensation of two fast reacting organic compounds in the presence of a porous substrate.

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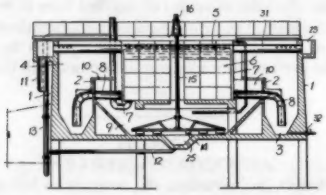
**3,744,643**

**SUSPENSION CLEARING TREATMENT DEVICE**

**Shogo Tsunoda, Tokyo-to, Japan, assignor to Ebara Infilco Kabushiki Kaisha, Tokyo, Japan**

**Filed June 11, 1971, Ser. No. 152,124**
**Claims priority, application Japan, June 15, 1970, 45/51739**
**Int. Cl. B01d *21/00***
**U.S. Cl. 210—522** **11 Claims**



A device for clarifying suspensions comprises an aggregation chamber, a floc-forming chamber and a settling chamber. The aggregation chamber has therein partitions to provide circuitous flow therethrough, preferably in a vertical direction. Openable ports are provided at the bottom of the aggregation chamber for removal of aggregate which might interfere with the flow of fluid therethrough. Flow of fluid from one chamber to another is essentially radial.

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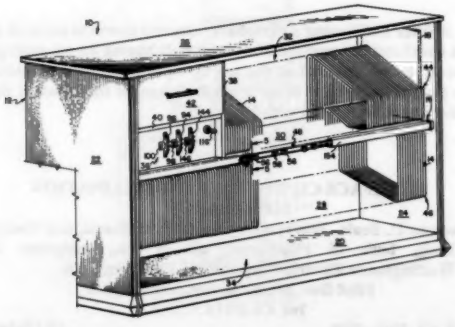
**3,744,644**

**PHONOGRAPH RECORD INDICATOR**

**Heinz W. Brosig, 5711 Sanger Avenue, Alexandria, Va.**

**Filed Sept. 27, 1971, Ser. No. 184,011**
**Int. Cl. A47b *81/06***
**U.S. Cl. 211—40** **11 Claims**



There is disclosed a method and apparatus for identifying phonograph records housed in a rack whereby a particular record sought may be quickly located. The identifying arrangement includes a multiple indicator carrying member mounted for movement adjacent the phonograph receiving rack, a tens position switch and a hundreds position switch for completing a circuit for energizing one of the multiple indicators and means for moving the member, in accordance with a units position digit, so that the energized indicator is aligned with the phonograph record being sought.

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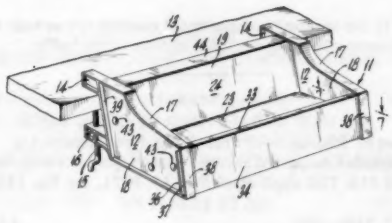
**3,744,645**

**AUXILIARY DISPLAY RECEPTACLE**

**Arthur Hochman, Union City, N.J., assignor to Flextender Corporation of America, Newark, N.J.**

**Filed Apr. 26, 1972, Ser. No. 247,611**
**Int. Cl. A47j *3/14***
**U.S. Cl. 211—126** **9 Claims**



An auxiliary display receptacle or shelf suitable for attachment to regular shelves in a supermarket can be assembled from brackets and foldable blanks. The brackets preferably have a plane of symmetry so that any bracket may serve as either the left or the right hand end of a receptacle. Blanks may be stored in flat condition, may be pre-scored for accurate folding and may have a wide range of lengths.

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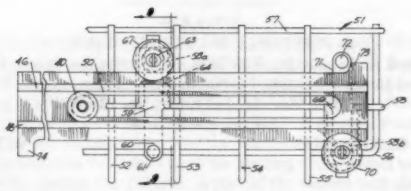
**3,744,646**

**WHEEL MOUNTING MEANS FOR DISHWASHER RACKS**

**Thomas W. Duncan, and Sylvan L. Hiers, both of Connersville, Ind., assignors to Design and Manufacturing Corporation, Connersville, Ind.**

**Filed July 19, 1971, Ser. No. 163,830**
**Int. Cl. A47f *5/00*; A47g *19/08***
**U.S. Cl. 211—162** **10 Claims**



Removable wheel mounting means for a dishwasher rack or the like. Each wheel mounting means comprises a wheel mount and a wheel rotatively affixed thereto. For each wheel mount there is provided a snap-acting means to removably affix the mount to the rack and means to prevent relative movement of the mount with respect to the rack.

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**3,744,647**

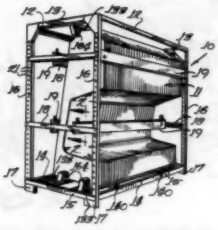
**STORAGE RACK RESTRAINING ASSEMBLIES**

**Robert M. Jelinek, Western Springs, Ill., assignor to The Ceco Corporation, Chicago, Ill.**

**Filed June 8, 1971, Ser. No. 150,953**
**Int. Cl. A47f *5/10, 7/00***
**U.S. Cl. 211—175** **12 Claims**

Restraining bar and load bar structures for use in storage and/or shipping racks for sheet metal or similar articles, such

as automobile fenders, hoods, doors or other parts, where the parts must be immobile for the extent of shipping. A shipping rack includes a top and bottom frame joined by vertical corner members, and horizontal end bars which extend between the corner members at suitable heights. An elongated aluminum bar has a spring-loaded releasable latch at each end cooperating with notches in the end bars to retain the elongated bars in position abutting the edges of the stored items to prevent movement. Also, an elongated three part load bar is provided in the top and bottom frames to adjustably position and hold the stored articles at the top and bottom edges thereof. All of the bars include slots to receive various dunnage materials used to hold the wares in place.



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**3,744,648**

## TOOL STORAGE FOR MACHINING CENTERS WITH A TOOL SEARCH ARRANGEMENT

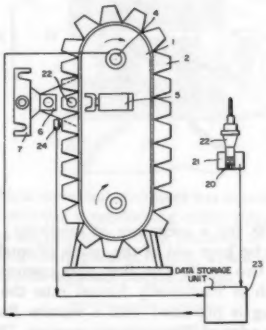
**Hans Kuhnert, Wiesloch, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany**

**Filed Jan. 20, 1972, Ser. No. 219,346**

**Claims priority, application Germany, Feb. 11, 1971, P 21 06 440.4**

**Int. Cl. B25j *3/00***

**U.S. Cl. 214—1 BB** **10 Claims**




A tool storage unit for a machining center with a tool searching arrangement for the selection of tools for a specific machining operation, including a tool changing arrangement for removing the selected tool from the tool storage unit and returning the used tool to the place made available therefor in the tool storage. The unit comprises an information storage arrangement which contains information indicating the order of sequence of the tools in the tool storage unit. The tool searching arrangement interrogates the information storage unit, and the selected tool, on the basis of the characteristic information obtained, is exchanged against the previously used tool.

**3,744,649**

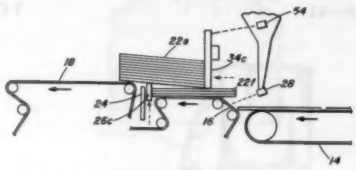
## SQUARING AND BUNDLE COUNTING MACHINE

**Henry D. Ward, Jr., Phoenix, Md., assignor to The Ward Machinery Company, Cockeysville, Md.**

**Filed May 5, 1972, Ser. No. 250,650**

**Int. Cl. B65g *57/30***

**U.S. Cl. 214—6 BA** **19 Claims**



A modern fully automated squaring and bundle counting machine that is used in the corrugated board box industry is provided to stack, square, count and eject, in bundles, folded and glued boxes that are being discharged at high speed from printing, scoring, folding and gluding type machines. This squaring and bundle counting machine consists of a flat bed frame with feed rollers at one end, where the glued, flat board boxes enter into a first hopper and are stacked, squared, and compressed therein.

A regulated speed belt removes the folded and glued boxes from the bottom of the stack in the first hopper, one by one.

The flat boxes are then counted by an electric eye beam and guided up onto a multi-belt conveyor where they are stacked again in a second hopper, from the bottom to a preset number per bundle. A unique arrangement of a moveable bar, and a pusher bar mechanism, operating together with electric eye switches and associated circuits, separate the bundles and ejects them onto a second multi-belt discharge conveyor. The cycle is then repeated without interruption to the flow of the boxes.

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**3,744,650**

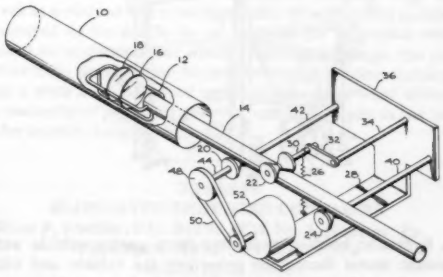
## BOAT MOVER FOR SEMICONDUCTOR FUSION PROCESS

**Thomas F. Henebry, Phoenix, Ariz., and Sandford Platter, Bolton, Mass., assignors to Semiconductor Electronic Memories Incorporated, Phoenix, Ariz.**

**Filed Oct. 26, 1971, Ser. No. 192,051**

**Int. Cl. F27d *5/00***

**U.S. Cl. 214—23** **5 Claims**



An arrangement for moving a boat carrying semiconductor wafers through a diffusion furnace is provided wherein the boat is supported free of the walls of the furnace while being moved therethrough, whereby damage to the wafers caused by sudden stops and starts of the boat is avoided.

3,744,651

## DEVICE FOR GUIDING A BODY SUSPENDED FROM ROPES WHEN LOWERING SAID BODY

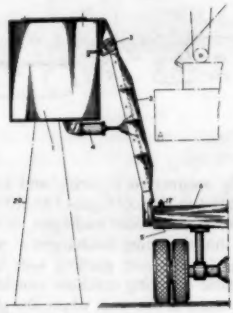
Jelis Verschoof, Haarlem, Netherlands, assignor to Werf Conrad & Stork Hijsch N.V.

Filed Jan. 31, 1972, Ser. No. 221,925

Claims priority, application Netherlands, Jan. 29, 1971, 7101225

Int. Cl. B65g 67/04

U.S. Cl. 214—41 7 Claims



A load is lowered onto a platform under the guidance of a pivotal structure which carries a switch contact adapted for engaging the side of the platform. The switch controls the operation of a piston-cylinder arrangement such that when the switch contact is not engaged with the platform, the guide structure will be pivoted until the switch comes into contact with the platform, whereupon the piston-cylinder arrangement serves as a buffer resisting pivotal movement of the guide structure away from the platform.

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3,744,652

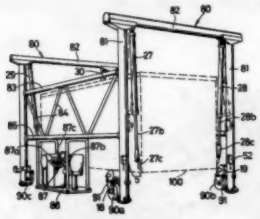
## HYDRAULIC HOISTING APPARATUS FOR USE WITH A ROAD VEHICLE

Hans Rieschel, Miltenberg (Main), Germany, assignor to Haamann, Josef and Freudenberger Winden-und Hebezeufabrik, Freudenberger/Main, Germany

Filed Mar. 29, 1972, Ser. No. 239,263

Int. Cl. B60p 3/00

U.S. Cl. 214—392 13 Claims



A hydraulic hoisting apparatus for a gantry vehicle with hydraulic motor means for propelling the vehicle and with front and rear hoisting devices. Either the hoisting devices or the motor means are selectively driven by two flows of a fluid medium discharged from two outlets of a motor driven main pump, and flowing first through two control valves, and then through two hoist valves, respectively. The hoist valves control direction and speed of the hoisting devices, and the control valves direct the two flows either to the hydraulic propelling motor means of the vehicle or to the hoist valves.

3,744,653

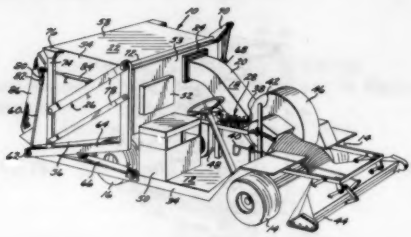
## LIFT DUMP VACUUM APPARATUS

William S. Jensen, Rolling Hills, Calif., assignor to Turf-Vac Corporation, Long Beach, Calif.

Filed Nov. 8, 1971, Ser. No. 196,570

Int. Cl. B60p 1/34

U.S. Cl. 214—502 2 Claims



A mobile lift dump vacuum apparatus which includes a vacuum system on a wheeled frame to pick up debris. A hopper on the frame is movable from a load position in which it receives debris from a discharge conduit of the vacuum system, to a dump position in which the debris is dumped. Articulated arms and linkages support the hopper for movement upwardly and rearwardly of the frame rear wheels for dumping the debris into elevated trash bins and the like. Anti-tip means on the rear of the frame constrain the frame against tipping when the hopper is in the dump position. Actuation of the articulated arms and linkages is coordinated to operate the anti-tip means only in the dump position of the hopper. Vacuum collection bags on the hopper are located for emptying simultaneously with dumping of the debris in the hopper.

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3,744,654

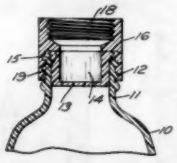
## SAFETY CLOSURE DEVICE

Henry Bromberg, 352 Grotto Avenue, Providence, R.I.

Filed Aug. 2, 1971, Ser. No. 168,322

Int. Cl. B65d 41/04, 55/02

U.S. Cl. 215—9 6 Claims



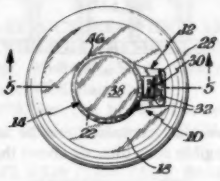
A safety closure for a container of medicine, poison, or other material to be kept out of the reach of small children. The closure has two parts. The first part comprises a tight fitting plug which is frictionally forced into the container opening. The plug is provided with a narrow flange which overhangs the top edge of the container opening. This flange is provided with an outer thread. The second part of the closure comprises an outer container cap in the form of a cylindrical member open at both ends. The main opening is internally threaded to engage complementary threads on the neck of the container. The plug flange does not extend to the outer edge of the container opening so that the cap clears the plug to engage the neck. When the cap is removed by unscrewing, the plug still remains in place to thwart the child. To remove the plug, the cap is reversed, the other end having internal threads for engaging the flange. By engaging these threads and rotating the cap, the plug is pulled from the container. In replacing the cap, the plug is pushed into position and the outer cap is screwed into place. As the outer cap moves downwardly, it pushes the plug tightly back into the container neck.

3,744,655

## SAFETY CLOSURE FOR CONTAINERS

Frank Nixdorff, Jr., Baltimore, Md., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed July 8, 1971, Ser. No. 160,737
Int. Cl. B65d 55/02
U.S. Cl. 215—9 15 Claims




A safety closure for containers includes a locking ring mounted to the neck of a container in such a manner as to prevent relative rotation thereto. A tab is connected to and extends away from the body of the mounting ring and includes at least one locking tooth for engagement with locking elements on the closure. A cut away portion is provided between the tab and locking ring body to form a hinged connection for the tab so that the tooth may be moved up and down into and out of engagement with the closure locking elements.

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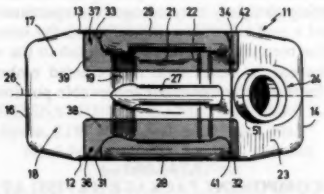
3,744,656

## CONTAINER

Wolfram Schiemann, Eugen-Nagele Strasse 17, 714 Ludwigsburg, Germany

Filed Nov. 12, 1971, Ser. No. 198,192
Claims priority, application Germany, Nov. 16, 1970, P 20 56 247.4
Int. Cl. B65d 11/26, 25/28
U.S. Cl. 215—31 7 Claims




A hollow blow-moulded container has injection moulded inserts for handles and a reinforcing outlet ring. The inner face of the inserts are provided with a plurality of raised portions, such as small cones or parallel fluting, which pierce but do not fully penetrate the adjacent container wall.

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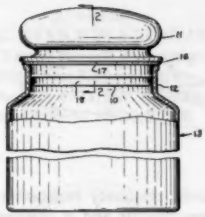
3,744,657

## PRESSURE-LOCKED SEALING ADAPTOR FOR BOTTLE CAP

Melvin Alpern, c/o Starlite Manufacturing Co., 9800 McKnight Road, Pittsburgh, Pa.

Filed Nov. 22, 1971, Ser. No. 201,038
Int. Cl. B65d 35/04
U.S. Cl. 215—48 5 Claims

Resilient plastic sealing adaptor for bottle or like cap having a tubular wall for telescopic reception within tubular neck of bottle. Adaptor has cup-shaped part including closed bottom wall and upturned annular wall portion for tight yielding reception of the tubular wall of cap, and integral axial extension of adaptor wall portion terminates in an annular flange adapted to be yieldingly compressed against annular seat on cap. Axial wall extension thereby defines closed, air-sealed annular cavity around tubular wall. Partial vacuum within annular cavity and also within a recess in cap is contained by bottom wall of sealing adaptor to assure tight adherence of adaptor to the cap without use of adhesive means.

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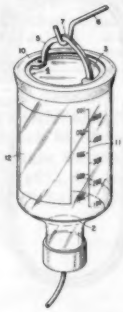
3,744,658

## DRIPPING BOTTLE

Masaaki Fujio, 3-15-8, Aoyamadai, Suita-city, Japan

Filed Dec. 13, 1971, Ser. No. 207,102
Int. Cl. B65d 25/22
U.S. Cl. 215—100 A 3 Claims




A hanging type bottle for use in dripping fluids into the body of a patient. The bottle contains a protective tube of plastic which adheres to the body of the bottle and a disc-like member attached to the outer bottom surface of the bottle. The disc-like member contains integral hanging rings and serves as a cushion and noise dampener. The disc-like member is secured to the bottle by an edge of the protective tube. Should an accident occur which results in breakage, the protective tube prevents the broken bottle from being scattered over a wide area. Standard type bottles can be used without the necessity of providing grooves, etc. in the body of the bottle for suitably hanging the bottle.

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3,744,659

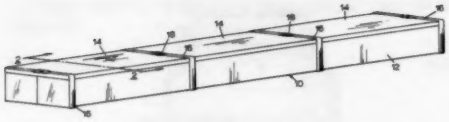
## ELONGATED RIGIDIFIED CONTAINER

William F. Koehler, P.O. Box 95, R.D. No. 1, Hanover, Pa.

Filed Apr. 5, 1972, Ser. No. 241,372
Int. Cl. B65d 25/00
U.S. Cl. 217—7 7 Claims

An elongated container capable of being formed in abnormal lengths from shorter lengths of channel members having bottom and side panels, said channels being abutted to form elongated series thereof and a plurality of said series being positioned contiguously in side-by-side relation but the abutting lines of the series respectively being staggered with each other and the contiguous side panels of the adjacent se-

ries of channel members being fixedly connected to form a unitary container having a series of parallel elongated com-



partments rendered relatively resistant to flexing. A cover overlies the compartments and is connected thereto by any suitable means.

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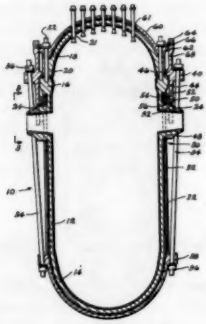
**3,744,660**

**SHIELD FOR NUCLEAR REACTOR VESSEL**

**Albert L. Gaines, West Simsbury, and Gennaro V. Notari, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Dec. 30, 1970, Ser. No. 102,800**
**Int. Cl. B65d 7/22**
**U.S. Cl. 220—10** **8 Claims**



A protective shield for a nuclear reactor vessel is disclosed that is operative to reduce the impact strength of high pressure fluid released as a result of a reactor accident and also to prevent the expulsion of high velocity fragments from the vessel. The shield is constructed of a plurality of independent cylindrical rings that are axialy secured by tie rods. The tie rods are adapted to expand in the event of an inordinate buildup of pressure behind the shield whereby the rings can be displaced to create narrow openings through which the fluid can be released at a reduced rate.

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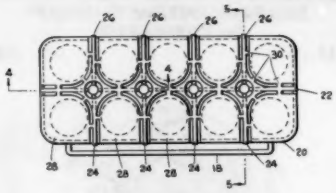
**3,744,661**

**TAMPERPROOF CONTAINER FOR VIALS OR THE LIKE**

**Raymond Frank Fischer, Jr., Denville, N.J., assignor to Ciba-Geigy, Ardsley, N.Y.**

**Filed June 11, 1971, Ser. No. 152,126**
**Int. Cl. B65d 1/24**
**U.S. Cl. 220—21** **17 Claims**

A tamperproof container for vials and the like formed from a receptacle base member and a lid which are adapted to be connected to each other by means of an interfitting structure of pins and columns extending from the lid and the base. The interfitting structure can be mechanically joined, chemically bonded, or ultrasonically welded, as is adapted to permanently join the lid to the base and to separate the assembled container into several sections. The lid is formed with frangible zones which are positioned to align with each of the sections of the assembled container so that access to each of the sec-



tions of the assembled container can be obtained only by removing the frangible zone directly above that section.

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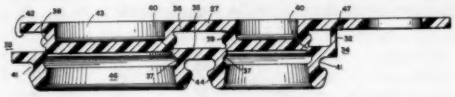
**3,744,662**

**OPENING DEVICE WITH NON-DETACHABLE TAB**

**Arthur P. Zundel, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.**

**Filed Nov. 23, 1971, Ser. No. 201,405**
**Int. Cl. B65d 17/00**
**U.S. Cl. 220—27** **19 Claims**



The improvement in an easy opening type of container of a container end with an opening device having a non-detachable tab and made of a material such as certain resilient plastics, and having a lip portion airtightly connected to the container end with apertures in the lip portion and the container end aligned, a removable portion connected to the lip portion by a hinge at the inner ends of the two portions, the removable portion also being airtightly bonded over the apertures in the lip portion, and a pull tab with a grip adjacent the inner end and tab extension means connecting the pull tab to the removable portion adjacent its outer end. A preferred embodiment is reclosable by reattachment of the removable portion to the lip portion.

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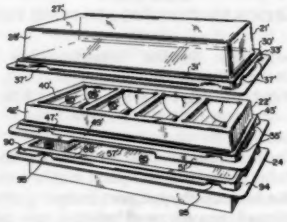
**3,744,663**

**THREE COMPONENT PACKAGE HAVING AT LEAST TWO COMPONENTS FORMED OF VACUUM MOLDED PLASTIC FILM**

**Robert A. Moren, Mount Prospect, Ill., assignor to Plastofilm, Inc., Wheaton, Ill.**

**Filed Aug. 21, 1969, Ser. No. 852,040**
**Int. Cl. B65d 11/10, 43/10, 21/00**
**U.S. Cl. 220—4 D** **7 Claims**



A package having three or more components is held together by multi-duty undercut in the middle component

which must be made of relatively thin material. Thus, the undercut in the middle receptacle component serves both as part of cover snap means and as retainer for bottom-most component.

Corner initiated rips in an article-receiving cavity are virtually eliminated by a novel indentation at the corners of the cavity.

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**3,744,664**

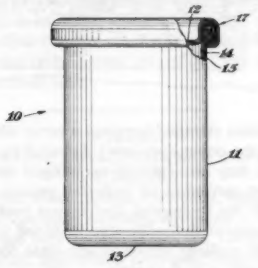
**METAL STRUCTURES WHICH ARE SELF-DESTRUCTIBLE BY CHEMICAL CORROSION**

**Percy F. George, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Mar. 5, 1970, Ser. No. 16,725. The portion of the term of this patent subsequent to Dec. 21, 1988 has been disclaimed.**

**Int. Cl. B32b *15/04, 15/12*; B65d *7/22***

**U.S. Cl. 220—10** **8 Claims**




A metal laminate is provided which will deteriorate, at least in part, after the interior of the laminate is contacted by moisture. Self-destructible containers are fabricated of this structural laminate. The laminate includes at least two metal layers. Preferably, both layers are comprised of the same metal. Positioned between the metal layers is at least one layer of a composition capable of chemically corroding the metal layers when the composition is contacted with moisture. A preferred metal-corroding composition is an inorganic salt, such an ammonium chloride.

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**3,744,665**

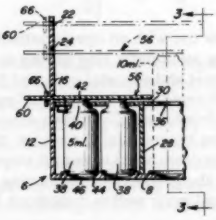
**COMBINATION VIAL AND TEST TUBE RACK**

**Victor T. Spoto, 2101 N.W. 36th St., Miami, Fla.**

**Filed June 14, 1971, Ser. No. 152,686**

**Int. Cl. B65d *1/24***

**U.S. Cl. 220—21** **9 Claims**




A portable multipurpose box-type compartmental rack for chemistry assaying in industrial laboratories embodying self-contained facilities for orderly racking bottle-type vials and test tubes. It is used for housing controls, standards and reagents and lends itself for use in an incubated water bath, when necessary. The loaded rack can stand upright in an upside-down position when used outside of a water bath. The compartments and selectively applicable and removable covering panels provide a rack which can accommodate up to four different size vials. Then, too, this rack when properly used constitutes a holder for test tubes and, to achieve this result, the bottom of each compartment is provided with concave centrally apertured seating depressions.

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**3,744,666**

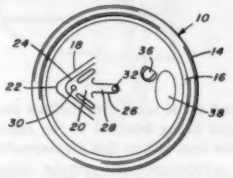
**EASY OPENING DEVICE IN A CONTAINER WALL**

**Robert E. Heffner, Lower Burrell, Pa., assignor to Aluminum Company of America, New Kensington, Pa.**

**Filed Dec. 27, 1971, Ser. No. 212,561**

**Int. Cl. B65d *17/20, 17/00***

**U.S. Cl. 220—48** **11 Claims**




An easy opening device is provided in a container wall including a score line in the container wall defining a panel which is at least partially severable from the wall and a tab with a nose end overlying the container wall and affixed to the removable panel near its starting end and a handle end toward the opposite edge of the container wall, and which further includes a tear strip defined by a U-shaped score with its open end toward the starting end of the removable panel and the handle end of the tab attached to the starting end of the tear strip.

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**3,744,667**

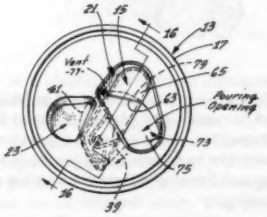
**CAN END WITH RETAINED TEAR STRIP**

**Ermal C. Fraze, and Francis M. Silver, both of Dayton, Ohio, assignors to Ermal C. Fraze, Dayton, Ohio**

**Filed May 8, 1972, Ser. No. 250,979**

**Int. Cl. B65d *17/00***

**U.S. Cl. 220—48** **14 Claims**




An easy opening container wall comprising a container wall of sheet material which is weakened in a preselected zone to define a wall segment bendable inwardly of the container wall about a bend line and a tab attached to the container wall for bending the wall segment inwardly. The tab can be pivoted through approximately 180° to thereby bend the wall segment inwardly approximately the same amount to form an opening in the container wall.

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**3,744,668**

**SCORE EDGE PROTECTION**

**Herbert D. Bartels, Palos Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**

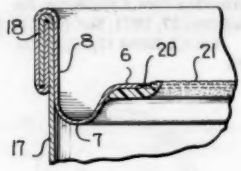
**Filed July 31, 1970, Ser. No. 59,931**

**Int. Cl. B65d *17/20***

**U.S. Cl. 220—54** **8 Claims**

This disclosure relates to the protection of a raw edge which results in the opening of a container by tearing either

completely or partially therefrom a panel portion. The panel portion is normally defined by a score line along which the container is ruptured, thereby permitting the displacement of the displaceable panel portion. The resultant raw edge is very sharp and may cause injury. It is proposed to mask the resultant raw edge by applying to the container a band of adhesive compound on at least one surface thereof with the adhesive compound being bonded to the container at opposite sides of the score line. When this displaceable panel portion is displaced, the compound will remain attached to the container surrounding the dispensing opening formed in the displacement of the panel portion and automatically mask the raw edge.

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**3,744,669**

**TEAR TAB FOR EASY OPENING METAL CANS**

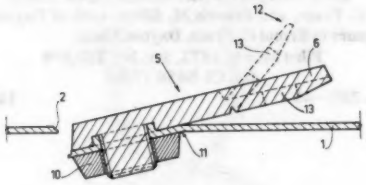
**Jean Cospen, Cachan, and Bernard Baumann, Paris 8e, both of France, assignors to CEBAL GP, Paris, France**

**Filed Apr. 14, 1971, Ser. No. 133,819**

**Claims priority, application France, Apr. 15, 1970, 7013593**

**Int. Cl. B65d *17/20***

**U.S. Cl. 220—54** **11 Claims**




A tear tab for easy opening metal cans in which the tab consists of a rigid or semi-rigid plastic material formed of two parts joined through an opening in the top wall of the can near the tear line with the two parts being joined in sealing relation in the opening and forming a rigid connection with the cover to seal the opening.

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**3,744,670**

**COMBINATION MANHOLE AND FILL**

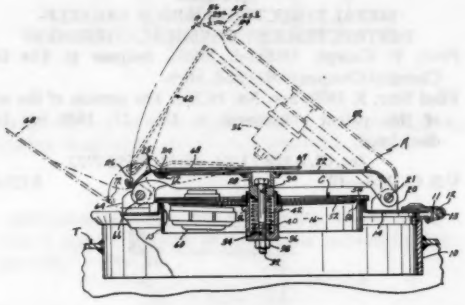
**Joseph H. De Frees, 414 Liberty St., Warren, Pa.**

**Filed Apr. 12, 1971, Ser. No. 132,991**

**Int. Cl. B65d *45/04***

**U.S. Cl. 220—57** **12 Claims**

A manhole closure means for sealing a tank manhole aperture including an elongated strongback carrying a fill cover on its underside for covering a fill aperture in the closure means, such strongback being hinged to the manhole closure means at one side of the fill aperture for swinging movement over and onto the fill aperture in closed position. An elongated latch arm is hinged to the manhole closure means adjacent the fill aperture in a position opposite the strongback for swinging movement toward and away from the strongback. The latch arm has its hinged end bifurcated forming an opening in which the free end of the strong-back is received. Positioned on the underside of the latch arm adjacent the inner edge of the latch arm opening is a transversely disposed downwardly extending ridge. The strongback has at least one transverse recess formed in its top side adjacent its free end for receiving the latch arm ridge when the strongback free end is inserted in the latch arm opening, thereby firmly and securely locking the strongback and its fill cover over the fill aperture in closed position thereby effecting an over-center mechanism that prevents the fill cover from opening inadvertently due to impact or shock. The fill cover may also include a springwell and an annular gasket clamped between a cover disc and a gasket retainer, with the cover disc being threaded to the springwell. The fill cover may also include an integral springwell and a dovetail gasket carried in an undercut groove. The fill cover may also omit the springwell and secure resilient action by means of a resilient Belleville disc included in the fill cover structure. This resilient action is adequate for latching purposes, but not adequate for venting.



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**3,744,671**

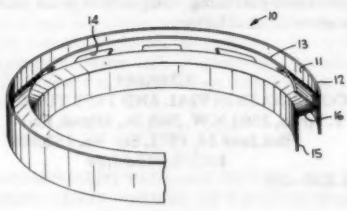
**OPEN CONTAINER ADAPTOR**

**Harvey F. Saunders, Jr., Route 1, Box 4, Smithfield, Va.**

**Filed Oct. 8, 1971, Ser. No. 187,790**

**Int. Cl. B65d *25/00***

**U.S. Cl. 220—90** **1 Claim**




An adaptor for use with an open container, especially paint cans, comprising an annular ring having an apertured groove defined by an inner and an outer wall, and further having a depending flange formed as an extension of said groove whereby the paint brush bristles may be drawn across the groove inner wall for removing excess paint therefrom, the apertures of the groove serving as drain holes to permit excess paint, which has accumulated in the groove by the drawing of the paint brush bristles across said inner wall to drain back into the open paint can.

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**3,744,672**

**PILL DISPENSER**

**Thomas C. Dangles, and Elsie R. M. Dangles, both of 10424 Lavergne, Oak Lawn, Ill.**

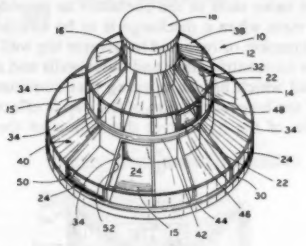
**Filed Sept. 21, 1972, Ser. No. 290,893**

**Int. Cl. B65d *83/04***

**U.S. Cl. 221—82** **10 Claims**

A container for easily loading, storing and discharging pills and including upper inner and lower outer annular storage

tiers each divided into twelve radially extending arcuately spaced pie-shaped compartments and numbered on a lower base plate consecutively from midnight to noon for the upper tier and noon to midnight for the lower tier. Each tier is



covered by a rotatable dial having a first horizontal opening for loading pills in each tier compartment and a second vertical opening adjacent and clockwise spaced from the first opening for selectively discharging pills from each compartment at a prescribed hour.

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**3,744,673**

**SELF-SERVICE DEVICE FOR SEWING THREAD PACKAGES**

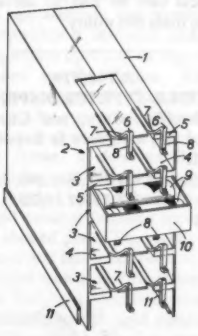
**Jurgen Lahmann, Haus Orehta, Germany, assignor to Gutermann, Fa., & Company, Gutach, Germany**

**Filed Sept. 14, 1971, Ser. No. 180,256**

**Claims priority, application Germany, Sept. 14, 1970, P 20 45 322.9**

**Int. Cl. A47f *3/02***

**U.S. Cl. 221—92** **7 Claims**



A self-service unit for dispensing sewing thread packages comprising a plurality of elongated compartments for housing the packages, each compartment having an open mouth in the front of the unit and extending rearwardly from said mouth, each compartment mouth being provided with upper and lower spring jaws to retain the packages within the compartment, and the upper and lower spring jaws being retractable and the compartments being of such dimensions that a box of packages may be inserted into each compartment through the mouth for filling purposes.

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**3,744,674**

**COMPRESSION PASTE TUBE DISPENSER**

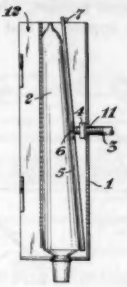
**Ralph A. Funke, Route 2, Farwell, Mich.**

**Filed June 7, 1971, Ser. No. 150,508**

**Int. Cl. B65d *35/28***

**U.S. Cl. 222—103** **3 Claims**

This disclosure relates to a compression paste tube dispenser especially adopted for tooth pastes. This dispenser has an open-end housing suitable for enclosing a paste tube and positioned therein is an inclined pressure plate which is in contact with the paste tube. Affixed to the open-end housing is a drive means which is in further contact with a cavity seat on



the incline pressure plate and this cavity seat is off-center. When pressure is applied by the drive means, the incline pressure plate equalizes itself at the top of the open-end housing and forces the contents of the paste tube out at the bottom.

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**3,744,675**

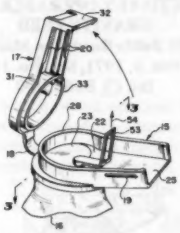
**EASILY OPENABLE SEALED PLASTIC CLOSURE**

**John S. Song, 2 Williamburg Circle, Evanston, Ill.**

**Filed June 2, 1971, Ser. No. 149,144**

**Int. Cl. B65d *47/10*; B67d *5/32***

**U.S. Cl. 222—153** **7 Claims**



A tear line in a plastic cover for a container comes to a point, which point is located at the upper surface of the cover. An integral projection overhangs this point and the projection has a handle. The initial part of the tear line from said point is between the projection and the surface.

A dust cover is formed of plastic and is hinged to the main cover of plastic by an integral strap. The main body has a dispensing opening. The dust cover has downwardly extending flanges fitting about the main body with detents serving to releasably hold the two together. These flanges restrict the movement of the dust cover with respect to the main body except by a movement in a single direction. Two spaced locks are formed by integral arms on the body which engage abutments on the dust cover to normally prevent movement of the dust cover in the opening direction.

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**3,744,676**

**MEANS FOR SUSPENDING AND VIBRATION ISOLATING FLOW PROMOTING APPARATUS FROM A FLOWABLE MATERIAL CONTAINER**

**George D. Dumbaugh, Louisville, Ky., assignor to Vibranetics, Inc., Louisville, Ky.**

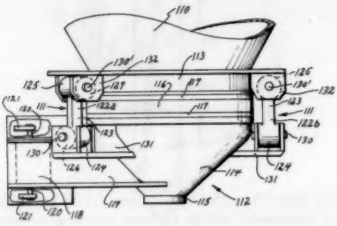
**Filed Mar. 13, 1972, Ser. No. 234,077**

**Int. Cl. B65g *3/12***

**U.S. Cl. 222—161** **8 Claims**

This invention provides improved means for suspending and vibration isolating material flow promoting apparatus from a

flowable material container. Basically, the improved means provided by the present invention comprises a member including a central portion, which can be arranged to extend generally vertically between the apparatus and the container, and first and second hollow end portions, located at the opposite ends of the central portion, which can be respectively interconnected to the apparatus and the container. Each of



the hollow end portions contains a vibration isolator, and each of the isolators has a bore, which will be arranged generally horizontally when the central portion of the member is arranged generally vertically, for respectively receiving fastener means for securing the first end portion of the member to the apparatus and the second end portion of the member to the container. In particular accordance with the present invention, the isolator bores have their central axes offset from one another by an angle.

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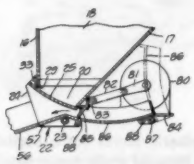
**3,744,677**

## PORTABLE HOPPER ASSEMBLY FOR BULK MATERIAL WITH SELECTIVELY OPERABLE POWER AND GRAVITY FEED

**David A. Beall, 1885 Robin Road, San Marino, Calif.**

**Filed Feb. 8, 1971, Ser. No. 113,436**
**Int. Cl. B66c *3/00***
**U.S. Cl. 222—162** **24 Claims**



A unitary portable hopper assembly for handling bulk material including a hopper tiltably connected to a support frame and equipped with a stationary closure for the hopper outlet. The support frame may be suspended from hoisting means or provided with floor-engaging skids, wheels or the like arranged to support the hopper outlet above a pushcart or other material distributing means. All interior hopper surfaces lie at about or in excess of the angle of repose under all operating conditions. The hopper assembly may include a powered feeder for the forced distribution of the bulk material discharging from the hopper to any of a variety of delivery areas selected at will.

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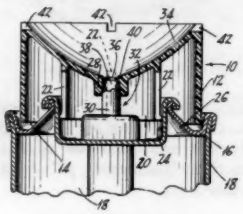
**3,744,678**

## MASS OR BULK FORMING DISPENSER CAP FOR PRESSURE CANS

**Steven W. Beres, Bridgeport, and Wolf Steiman, Fairfield, both of Conn., assignors to VCA Corporation, Greenwich, Conn.**

**Filed June 18, 1971, Ser. No. 154,340**
**Int. Cl. B65d *83/14***
**U.S. Cl. 222—205** **5 Claims**

A one-piece molded plastic dispenser cap for discharging and collecting foam-producing pressurized substance. The cap comprises a shell-like body having annular concentric inner and outer walls arranged to movably mount the cap on the valve-carrying end closure of a pressurized container for limited axial movement thereon between non-discharging and discharging positions. A hollow boss of the body frictionally fits over the valve stem of the container to provide for actuation of the stem when a discharge is to be effected. The cap body has a concave or recessed transverse top wall which joins together the concentric inner and outer walls and also the hollow boss and which has an opening that communicates with the bore of the boss. Actuation of the cap is effected by placing the palm of the hand over the hollow of the transverse



wall, and pressing the cap inward thereby. Vent passages in the form of notches are provided at the periphery of the transverse top wall, to vent air therefrom as the cap is being pressed inward by the palm and as pressurized product from the container is introduced into the hollow of the wall from the valve stem. Such pressurized product is of the foam-producing type which quickly fills the hollow of the wall and thereby forms a relatively large, accessible mass that can thus easily be removed. The product mass, for example, can contain ingredients which result in a hot foam-type shaving lather, or other end products can be had to serve various purposes where a foam-type mass has utility.

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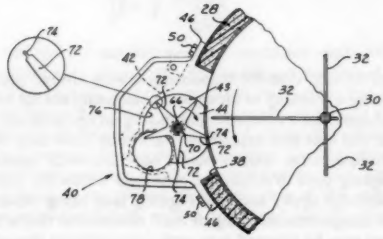
**3,744,679**

## PADDLE-TYPE ICE DISPENSER

**Robert M. Nitschneider, Cary, and Charles G. Neumann, Palatine, both of Ill., assignors to Reynolds Products, Inc., Schaumburg, Ill.**

**Filed Sept. 13, 1971, Ser. No. 180,016**
**Int. Cl. G01f *11/20***
**U.S. Cl. 222—238** **11 Claims**



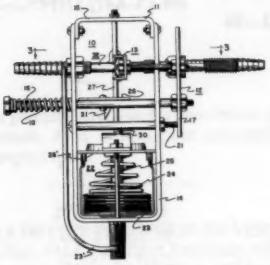
An ice dispenser for delivering a predetermined quantity of ice per unit time as determined by the speed of rotation of a delivery motor in which a paddle wheel driven by the motor is mounted for rotary movement in a housing adjacent to the outlet of an ice maker storage chamber having an agitator therein so that upon concomitant rotation of the paddle wheel and the agitator the paddle wheel receives ice from the agitator and carries it to an outlet through which it passes to a cup or the like.

3,744,680

## GAS CONTROL BEER DISPENSER

Vernon C. Salmonson, 530 Second Avenue South, New Rockford, N. Dak.

Filed Dec. 20, 1971, Ser. No. 209,723
Int. Cl. B65d *83/00*
U.S. Cl. 222—399 3 Claims



The gas control beer dispenser of this invention comprises a frame, a carriage slidably carried in the frame, a latching servomechanism disposed in the frame, a gas valve and a fluid valve actuated by travel of the carriage with respect to the frame. The frame includes a substantially U-shaped plate providing a front wall, a back wall and a bottom wall to the frame, and including an enclosure plate fastened to the lowermost terminal ends of the U-shaped plate. The carriage includes a pair of carriage bolts disposed rectilinearly through holes in the frame and disposed substantially parallel to the enclosure wall, an upstandingly transversely disposed plate fastened to the forwardmost terminal ends of the carriage bolts, and an urging means operable to urge the carriage rearwardly with respect to the frame. The latching servomechanism includes an upwardly directed bellows provided with pressure through a by-pass conduit from a suitable source mounted to the bottom wall of the U-shaped plate by means of a servomechanism frame, a downwardly directed urging spring, and an upstanding rod-like plunger operable to engage a suitably disposed dog fastened to the carriage bolts. The gas valve includes a rigid conduit fastened forwardly to the rearward wall of the U-shaped plate. The rigid conduit includes a closure at its midpoint and holes disposed on either side of the closure, and is provided with a pair of nipples fastened at each of its terminal ends. The rigid conduit is covered by a flexible resilient conduit fastened to the rigid conduit and a conduit closure means, which may be a roller, fastened rearwardly distally from the carriage plate on a stem operable to position the roller over the rigid conduit closure. The fluid valve includes a flexible resilient conduit substantially the same length as the distance between the rear wall and the plate when the carriage is in its forwardmost position and fastened by means of nipples to the rear wall of the U-shaped bracket and to the carriage plate.

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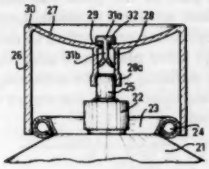
3,744,681

## SPOUT FOR DISPENSING FLUIDS FROM PRESSURIZED CONTAINERS

Bruno P. Morane, Paris, France, assignor to L'Oreal, Paris, France

Filed Mar. 8, 1971, Ser. No. 121,946
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.12 8 Claims

Spout for dispensing fluids from pressurized containers comprises baffle disc which slows ejection of fluid and rim



which, when applied to surface to be sprayed, limits the area of application.

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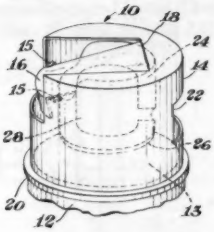
3,744,682

## SAFETY OVERCAP FOR AEROSOL CONTAINERS

Elliott E. Blank, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 1, 1971, Ser. No. 176,919
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.11 7 Claims



A safety overcap which, when attached to an aerosol container, provides pivot locking of the actuator means to prevent uninformed users such as children from dispensing products which may cause harm to them or others.

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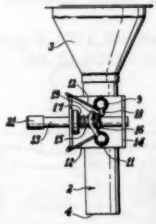
3,744,683

## DISPENSER HAVING SEQUENTIALLY OPERATED VALVES

Edward Eric Leggett, Mornington, Victoria, Australia, assignor to Teco Supplies Pty. Ltd., Victoria, Australia

Filed Sept. 24, 1970, Ser. No. 75,083
Int. Cl. G01f *11/46*
U.S. Cl. 222—446 7 Claims



A valve assembly for dispensing a metered quantity of granular material and having two valve plates which define a metering chamber therebetween. One plate forming the inlet valve and being normally open, and the other plate defining the outlet valve and being normally closed. Actuating mechanism is operatively connected to both plates and includes a push rod which is adapted for movement from a

release position to a discharge position. The operative connection is such that a first part of the push rod movement causes the inlet valve plate to be moved into a closed position, and during a second part of the push rod movement the outlet valve is moved into an open position. Lost motion means is provided in the operative connection to delay opening movement of the outlet valve plate until after the inlet valve plate reaches its closed position, and the actuating mechanism holds the inlet valve plate closed until the outlet valve plate returns to its closed position.

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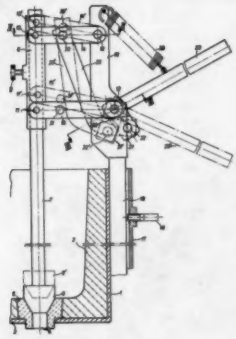
**3,744,684**
**STOPPER HOLDER FOR A CASTING LADLE**
**Julius Heimgartner, Sulz-Attikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland**
**Filed Oct. 27, 1971, Ser. No. 192,960**
**Claims priority, application Switzerland, Dec. 4, 1970, 17966/70**
**Int. Cl. B22d *37/00***
**U.S. Cl. 222—509** **4 Claims**



The holder uses two parallel links to control the lifting and lowering of the stopper. The lower link is longer so as to pivot with a longer pivot arm. This allows the stopper to move as straight as possible. Also, the actuating lever is connected over a toggle to the upper link so that a relatively great force is applied to lift the stopper initially with a small movement of the toggle. This allows fine metering of the casting stream.

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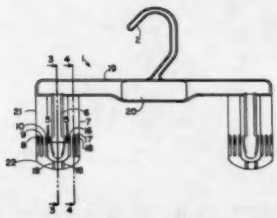
**3,744,685**
**HANGER FOR TROUSERS**
**Robert L. Hart, Manhasset Hills, N.Y., assignor to W. R. Grace & Co., Duncan, S.C.**
**Filed June 14, 1971, Ser. No. 152,772**
**Int. Cl. A47j *51/14***
**U.S. Cl. 223—96** **8 Claims**



This invention is a one piece hanger for garments having waist-bands. The hanger has a cross-beam which is carried by a centrally located hook; and, from each end of the beam, three co-operating fingers depend for gripping the waist-band. Each finger is provided with three spaced, outwardly projecting ribs for retaining the waist-band. A horizontal supporting bar can be provided below the fingers so that lengthy garments may be folded over it.

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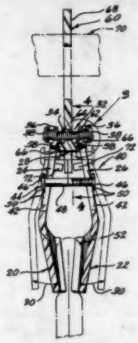
**3,744,686**
**ADJUSTABLE GARMENT HANGER**
**Benajmin Levitin, c/o P.O. Box 18948, Los Angeles, Calif.**
**Filed May 3, 1971, Ser. No. 139,742**
**Int. Cl. A47j *51/14***
**U.S. Cl. 223—96** **1 Claim**



An adjustable garment hanger having a pair of jaw members provided with a pair of upwardly extending lever members and having fulcrum means positioned therebetween so as to mount the lever members and the jaw members for relative pivoting movement around said fulcrum means such as to move said jaw members between open and closed positions and with said hanger being provided with jaw operating, retaining, and releasing means of an adjustable type operable to lock said jaw members on opposed sides of portions of a garment to be engaged and held thereby and which may be of virtually any desired thickness because of the adjustability of the jaw operating, retaining, and releasing means and with the device further being provided with controllably adjustable open-position-adjusting means for determining the extent of opening movement of the opposed jaw members when the jaw operating, retaining, and releasing means is moved into jaw-open released position. In a preferred form, the adjustable garment hanger may be provided with hanger intercoupling means for coupling two or more of such hangers together in offset and usually downwardly displaced relationship and in a manner such that the hook member of one of said hangers supports the entire group of intercoupled hangers whereby to greatly enhance the efficiency of space utilization such that for greater than the the normal number of hangers and garments supported thereby can be positioned within a given spacial region below a hanger-supporting pole, or the like.

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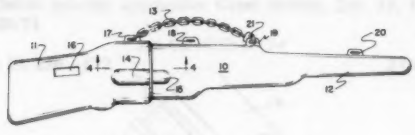
**3,744,687**
**GUN CONTAINER**
**Richard A. Oreck, 3206 Plant Drive, Boise, Idaho**
**Filed Aug. 16, 1971, Ser. No. 171,825**
**Int. Cl. F41c *27/00***
**U.S. Cl. 224—2 A** **7 Claims**

A gun container for protecting, transporting and storing long guns comprising scabbard and boot members, both formed of rigid, molded material and each having a cushion-like, resilient interior.

The scabbard and boot members telescopingly, sealingly engage and lock relative to one another with a common carrying handle. Detent locking means selectively operable to slidably engage the boot and scabbard members until the length of the

container is substantially coincident with the length of a gun carried therein.

The container is shaped to solidly engage only durable por-



tions of the gun placed therein and is operable to protect more fragile components, such as magazine assembly and scope, from exterior impact force.

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**3,744,688**

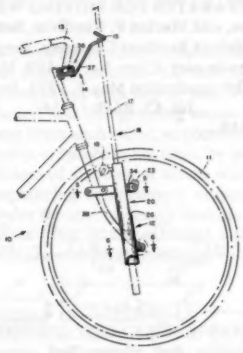
**CARRIER DEVICE FOR WHEELED VEHICLES**

**Thatcher W. Kezer, 241 Ferry Road, Salisbury, Mass.**

**Filed Sept. 27, 1971, Ser. No. 183,844**

**Int. Cl. B62j** *11/00*

**U.S. Cl. 224—32 R** **7 Claims**



A device for carrying rod-like items, such as fishing rods, on a vehicle, such as a bicycle, which device includes a tubular member attached to the front wheel thereof, which member has an elongated slot, and an upper member attached to the handlebars thereof which member has a spiral shaped open ring positioned above and in alignment with the opening of the tubular member so that the upper portion of a fishing rod is held in the open ring while the handle thereof is held in the tubular member.

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**3,744,689**

**CARRIERS, UTILIZING WHEEL SUPPORTS, HOLD DOWNS AND LOADERS FOR TWO WHEEL VEHICLES CARRIED ON CARS, TRUCKS, AND OTHER VEHICLES**

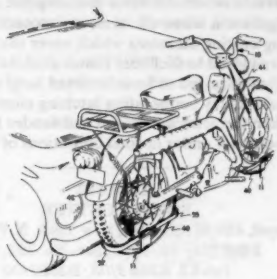
**Rodger J. Kjensmo, P.O. Box 115, Lynnwood, Wash.**

**Filed Apr. 29, 1971, Ser. No. 138,437**

**Int. Cl. B60m** *9/10*

**U.S. Cl. 224—42.03 B** **2 Claims**

For carrying two wheeled vehicles, wheel supports, in pairs, with and without cross tracks and ramps, are attached to front or rear bumpers of cars, station wagons, pick-up trucks or other vehicles having suitable appendages. Each wheel support carrier properly spaced, mounted and adjusted will support the weight of an entire two wheeled vehicle. After tie downs are secured to holding posts of the wheel supports or otherwise secured, the two wheel vehicle so secured is ready



for safe transport during travel on arterials and backwoods trails.

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**3,744,690**

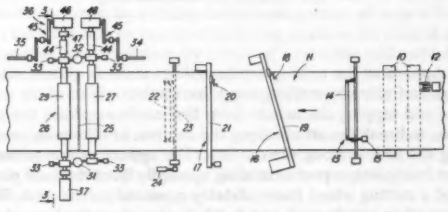
**CUTTING GLASS**

**Martin Ernest Gray, Liverpool; Dennis William Whittaker, St. Helens, and David Appleton, Warrington, all of England, assignors to Pilkington Brothers Limited, Liverpool, England**

**Filed Mar. 17, 1972, Ser. No. 235,697**

**Int. Cl. B26f** *3/00*

**U.S. Cl. 225—2** **11 Claims**



Apparatus for cutting reinforced glass sheet material having elongated reinforcing members extending across the cutting line, comprises cutting means for cutting the glass material along the required cutting line and severing means for severing the reinforcing members by effecting repeated vibratory movement of the glass on one side of the cutting line relative to the glass on the other side of the cutting line, the movement being parallel to the cutting line and in the plane of the sheet material.

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**3,744,691**

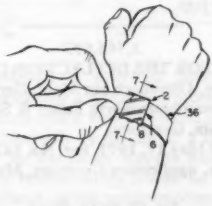
**SECURITY CLIP**

**Stuart T. Shears, Belmont, Mass., assignor to TRW Inc., Cleveland, Ohio**

**Filed Aug. 9, 1971, Ser. No. 170,161**

**Int. Cl. B26f** *3/02*

**U.S. Cl. 225—84** **6 Claims**



A security clip which is particularly adapted for securing a tape strip in a closed loop form has a pair of hinge connected

arms normally disposed in an open, diverging attitude. One of the arms is adapted to be fastened to the end of a tape strip and carries means for engaging and securing a reach of the tape strip fed between the arms to clamp the strip in a closed loop configuration when the arms are closed. The arms carry cooperating cutting elements which sever the tape strip when the arms are closed to facilitate removal of the length of a strip excess to that required to form a closed loop of a desired size. The arms also carry cooperating latching elements which lock the clip when the arms are closed and render the clip substantially tamperproof under normal conditions of usage.

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**3,744,692**

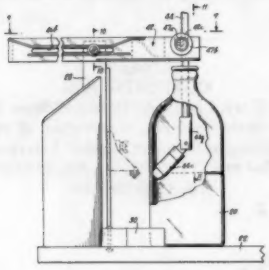
**BOTTLE CUTTER**

**John S. Doyel, 404 W. 20th St., New York, N.Y.**

**Filed May 10, 1972, Ser. No. 252,349**

**Int. Cl. B26d *3/08*; B26f *3/00***

**U.S. Cl. 225—96** **18 Claims**



Apparatus for cutting brittle articles such as glass bottles, jugs and tubes by scribing a cut line on the outside of the article and tapping the article from the inside, opposite the cut line, to break the article along the cut line, or otherwise severing the article along the cut line. The apparatus comprises a flat base plate, a post extending upwardly from the base plate and a cutting wheel frame slidably mounted on the post. The base of an article such as a bottle is placed on the base plate and the position of the cutting wheel frame is adjusted to the level of the desired cut line on the article. The cutting wheel frame is then suitably tilted, if necessary, such that the cutting wheel is perpendicular to the article at the desired cut line. Th lateral position of the article is defined by means of an arm pivoted on the base plate, and the article is then manually rotated against the cutting wheel and against the arm while its bottom remains on the base plate. When a cut line is scribed around the circumference of the article, a tapper is introduced into the article to tap the inside wall opposite the scribed cut line. The tapper may be suspended from a boom extending from the top of the post or from the cutting wheel frame, or it may be an independent tapper. The article may be severed along the cut line by other means, such as thermal shock. A particular advantage of the invented apparatus is that it can be conveniently used to cut articles of irregular cross-section, such as rectangular or odd-shaped bottles, as well as articles which have wide mouths, such as jars or vases, and larger articles such as large jugs.

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**3,744,693**

**TURNING BAR FOR THE DEFLECTION OF PAPER WEBS**

**Harry M. Greiner, Offenbach am Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach am Main, Germany**

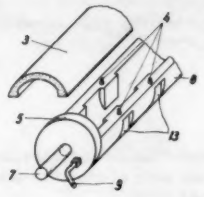
**Filed May 17, 1971, Ser. No. 143,963**

**Claims priority, application Germany, May 29, 1970, P 20 26 355.2**

**Int. Cl. B65h *17/32***

**U.S. Cl. 226—97** **6 Claims**

A turning bar to deflect a moving web has part of its cylindrical periphery of porous air permeable material so that air may pass therethrough from within the bar to prevent the web making surface contact with the bar, which part is readily detachable from the rest of the bar for cleaning or replacement. The detachable part can be secured by screws or may



consist of a porous flexible sheet stretched over a perforated segment of the bar and secured by quick fastening devices. To render the bar useful for locks which are narrower than the bar length detachable covers are provided to mask off end portions of the porous part.

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**3,744,694**

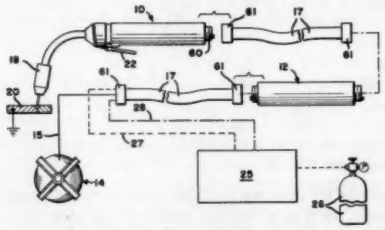
**APPARATUS FOR MOVING WIRE**

**Donovan Karnes, and Marion F. Centliver, both of Troy, Ohio, assignors to Hobart Brothers Company, Troy, Ohio**

**Continuation-in-part of Ser. No. 40,189, May 25, 1970, abandoned. This application May 7, 1971, Ser. No. 141,290**

**Int. Cl. B65h *17/24***

**U.S. Cl. 226—168** **31 Claims**



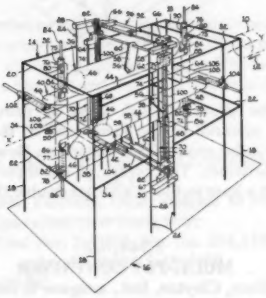
An apparatus for moving cylindrical members, particularly welding wire, includes a rotary to linear actuator having a body with an axially extending opening through which the wire is fed and a plurality of rollers mounted to rotate with the actuator body, the axis of each roller being skewed or inclined relative to the axis of rotation to impart a component of force to the wire to move it in a linear direction through the actuator as the actuator is rotated. At least one roller is carried on a movable arm mounted on the actuator body. This arm includes sufficient mass to counterbalance substantially the centrifugal force imposed on the roller as the actuator body is rotated. In one preferred embodiment, the arm is pivotally mounted on the actuator body. Biasing means, such as torsion bars or small springs, provide force to urge the rollers against the wire. In another embodiment, a centrifugal weight on the mounting arm provides additional force to urge the rollers against the wire. The actuator body is rotated by a motor having an axially extending opening in its armature through which the wire may pass.

3,744,695

## HAUL-OFF MACHINES

John George Postins, Wednesbury, England, assignor to Mil Limited, Wolverhampton, England

Filed Jan. 17, 1972, Ser. No. 218,296
Claims priority, application Great Britain, Jan. 15, 1971, 2,020/71
Int. Cl. B65h 17/34
U.S. Cl. 226—172 2 Claims



A haul-off machine for hauling a continuously extruded article from an extruding machine and having a plurality of driven gripping means between and by which the extruded article can be hauled and the gripping means being movable towards and away from each other, to accommodate extruded articles of different cross-sectional sizes, by pneumatic piston and cylinder devices of adjustment means which also includes a movement equalizing arrangement comprising hydraulic piston and cylinder devices to ensure that the driven gripping means on opposite sides of the extruded article move equal distances towards and away from each other.

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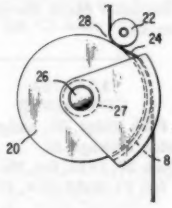
3,744,696

## RECORDING WEB GUIDE APPARATUS

Henry Ray Warren, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1971, Ser. No. 189,531
Int. Cl. B65h 23/04
U.S. Cl. 226—181 6 Claims



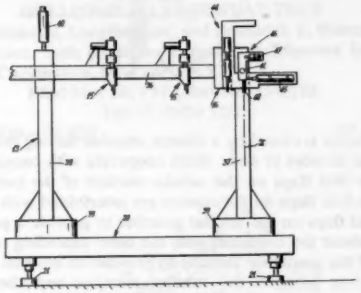

A device for controlling the path of a recording web with respect to a pinch roller-capstan drive arrangement to minimize contact of the web with the periphery of the pinch roller.

3,744,697

## APPARATUS FOR THE FABRICATION OF AN INSULATING PANE UNIT

Michel Jacquot, Beynes, and Charles Amicel, Carrieres/Seine, both of France, assignors to Boussois Souchon Neuvesel, Paris, France

Filed June 1, 1971, Ser. No. 148,518
Claims priority, application France, June 16, 1970, 7022107
Int. Cl. B23k 1/20
U.S. Cl. 228—5 20 Claims



The disclosure relates to an apparatus for fixing an intercalary sectional strip on a rectangular glass pane. In accordance with the disclosure, a portion of a continuous sectional strip is placed in contact with a first side of one face of the pane which is carried by a lifting device; this portion of strip is fixed on said first side by means of soldering devices; the plate is displaced in pivotal motion by means of a movable table which is traversed by a rotary suction cup in order to place a second side in contact with a following portion of strip; this portion of strip is fixed on said second side; the preceding cycle of operations is repeated for the following sides, the strip is cut to the necessary length, the intercalary sectional strip is closed and thus fixed on the glass pane. The disclosure is applicable to the fabrication of insulating pane units.

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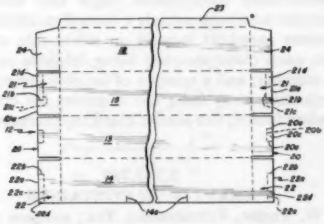
3,744,698

## FOLDING CONTAINER

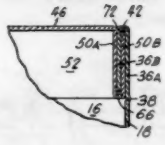
Terrill L. Nederveld, Neffsville, Pa., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Jan. 18, 1972, Ser. No. 218,795
Int. Cl. B65d 5/72, 85/66
U.S. Cl. 229—17 RS 10 Claims



A folding container is provided which is particularly adapted to accommodate a cored roll product. The design of the container is such that it may be loaded or unloaded either manually or mechanically by the use of a sling or shaft hoist. The endwalls of the container include means whereby portions thereof may be outwardly folded so as to expose segments of the endfaces of the accommodated product during loading or unloading of the container, or remain in an unfolded condition so as to conceal the endfaces of said product during shipment or storage of the loaded container.

**3,744,699**
**INTERNAL INTERLOCKING FLAP BOX**
**Norman E. Burgess, Westmount, Quebec, Canada, assignor to Domtar Limited, Montreal, Canada**
**Filed May 30, 1972, Ser. No. 251,543**
**Claims priority, application Canada, June 18, 1971, 116098**
**Int. Cl. B65d 13/00**
**U.S. Cl. 229—23 R** **3 Claims**




A carton is closed by a closure member having double fold flaps at its sides or ends which cooperate with corresponding double fold flaps on the tubular section of the carton. The double fold flaps on the closure are interfolded with the double fold flaps on the tubular member to provide a peripheral band about the container with the band extending on the inside of the container thereby to provide an internal cushion. The joint between the tubular member and the closure member is exposed at the end of the container adjacent the corner edge thereof so that a tape may be simply applied over the corner of the container and across the joint to hold the container closed.

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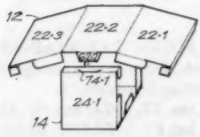
**3,744,700**
**BLANKS FOR BOXES**
**John Stegmann, 1 Heath St., Newlands, Republic of South Africa**
**Filed July 21, 1971, Ser. No. 164,521**
**Claims priority, application Republic of South Africa, July 29, 1970, 70/5258**
**Int. Cl. B65d 13/00**
**U.S. Cl. 229—23** **5 Claims**




The invention discloses a blank of stiff sheet material having two substantially longitudinal edges and including three quadrilateral members, namely a central member and two adjacent outer members located on either side of the central member; each outer member being foldable relative to the central member; and a number of suitably arranged engaging tabs projecting away from the members for connecting the blank, when folded, to a similar blank thus forming a box.

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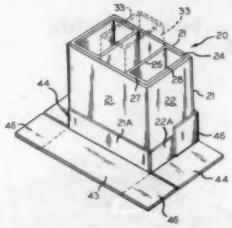
**3,744,701**
**HEAVY DUTY CONTAINER**
**Joseph W. Taylor, Friendswood, Tex., assignor to Container Corporation of America, Chicago, Ill.**
**Filed June 1, 1972, Ser. No. 258,528**
**Int. Cl. B65d 13/00, 5/48**
**U.S. Cl. 229—23 R** **5 Claims**

A heavy duty container is formed from cut and scored paperboard sheet material and comprises first and second scored blanks each including main and side foldably connected panel elements with auxiliary panel elements foldably connected to each other. The auxiliary elements are foldable to position to define a tube with the side panel and having a double thickness wall therewith. The cut and scored blanks are placed and secured in position with respect to each other to define three tubes with the endmost of the tubes provided with double thickness side and end walls. A closure structure is provided for at least one of the so-connected tubes, and the




tubes may be provided with flaps to provide additional thickness of material at the lower end of the container to cause same to be especially resistant to flowable materials within the container. The center of the three tubes may be provided with a liner so that it also has double thickness walls.

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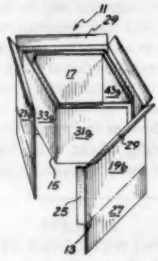
**3,744,702**
**MULTI-PLY CONTAINER**
**Donald E. Ellison, Clayton, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.**
**Filed Jan. 26, 1972, Ser. No. 220,839**
**Int. Cl. B05d 13/00**
**U.S. Cl. 229—23 R** **7 Claims**




A multi-ply container of fiberboard material made from three separate four-panel blanks adhesively attached to one another. At three of the four corners there are hinge lines from only two of said blanks, whereas at the remaining corner there is one hinge line from each blank. However, the hinge line at this corner of either the inner or center blank has a central blind slot extending for the major portion of its length, and the hinge line of the other blank has upper and lower short slots at the ends thereof.

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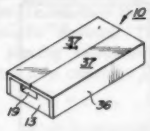
**3,744,703**
**CONTAINER**
**Wallis Mortenson, Park Ridge, Ill., assignor to Container Corporation of America, Chicago, Ill.**
**Filed Jan. 24, 1972, Ser. No. 220,189**
**Int. Cl. B65d 5/44, 5/48**
**U.S. Cl. 229—27** **1 Claim**

A container for one or a plurality of like objects such as stereo cassettes, said container being formed from a cut and scored blank of paperboard or the like and comprised of a main panel having first and second article securing members foldably connected to opposed sides of a main panel. One of the article securing members is selectively foldable to secure one or more of the like objects into position, and the second securing member is provided with structure selectively folda-

ble to position according to whether none or a pair of the objects is secured in position. Each of the article securing members has an element foldable into confronting and contacting relationship with the other article securing member, irrespective of the number or presence of the objects secured in position within the article securing members. Closure structure extends from the remaining opposed edges of the main panel and cooperates with the first and second article securing members.



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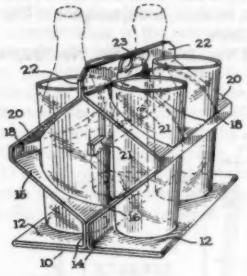
**3,744,704**

## FOLDABLE CARRIER FOR BOTTLES, GLASSES AND THE LIKE

**Glenn E. Struble, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.**

**Filed Dec. 2, 1971, Ser. No. 204,119**
**Int. Cl. B65d *5/48, 5/50***
**U.S. Cl. 229—28 BC** **22 Claims**



A foldable carrier for articles such as bottles, glasses, and the like comprising a horizontal base, a partition, article retaining sections, a carrying handle, and optional locking tabs, and a blank for forming said carrier.

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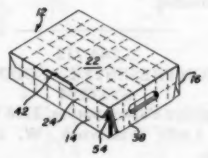
**3,744,705**

## CARTON CLOSURE RIGIDIFYING CONSTRUCTION

**Wayne H. Kuhn, Worth, Ill., and Jerry W. Harrison, Andalusia, Pa., assignors to Stone Container Corporation, Chicago, Ill.**

**Filed Oct. 30, 1970, Ser. No. 85,622**
**Int. Cl. A45c *13/26***
**U.S. Cl. 229—33** **6 Claims**



A carton formed from foldable paperboard, cardboard or the like to include a first or top panel with a hingedly connected end closure or manufacturer's flap, a second or front panel juxtaposed the top panel for adhesive attachment thereto by means of the flap, a pair of parallel side panels, and a rear panel disposed parallel to but spaced from the front panel. The flap forms a joint completing assembly of the carton. In one embodiment, slot and tab means are provided between the juxtaposed top and front panels which enable the tab means to maintain the joint rigid and intact while the adhesive sets. In another embodiment, in addition to the slot and tab means, a pair of flaps are hingedly connected to the side panels, respectively, to abut the rear panel and provide support to prevent bending thereof as the carton is being formed.

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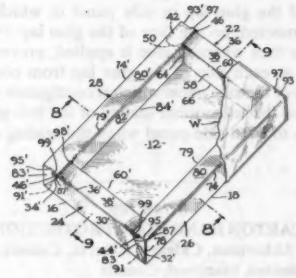
**3,744,706**

## HOLLOW WALLED DISPLAY TRAY

**Frank Colantoni, Longmeadow, and Frederick T. Waterhouse, Wibraham, both of Mass., assignors to Diamond International Corporation, New York, N.Y.**

**Filed May 26, 1972, Ser. No. 257,173**
**Int. Cl. B65d *5/22***
**U.S. Cl. 229—34 HW** **17 Claims**



A foldable display tray comprising two pairs of opposed hollow parallel wall panel arrays defining a generally rectangular bottom support panel including means for locking intersecting ends of said wall panel arrays together to prevent collapse thereof and a blank for forming said tray.

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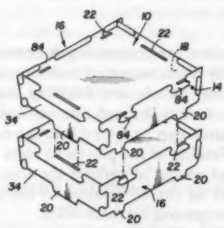
**3,744,707**

## CARDBOARD TRAY CONTAINER

**Donald R. Ross, 126 California Avenue, Freeport, N.Y.**

**Filed Oct. 21, 1971, Ser. No. 191,426**
**Int. Cl. B65d *5/26***
**U.S. Cl. 229—35** **6 Claims**

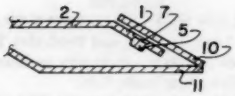


A cardboard blank which is readily erected into a tray-like base having a closure or top panel. Construction contemplates the folding of a pair of opposite side panels into elevated positions relative to a bottom panel, followed by folding of opposite end panels into interconnected relation with the side panels, and then use of the closure or top panel to lock all panels in place. During folding movement of the panels, stacking tabs are projected out of the bottom panel into depending relation therewith and are insertable into slots of a top panel of a supporting container to minimize any shifting in a stacked arrangement of the containers.

**3,744,708**
**STRUCTURE FOR FOLDING CARTON**

**Selby A. Gardner, and Robert J. Krackenberger, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Aug. 10, 1971, Ser. No. 170,567**
**Int. Cl. B65d 5/42**
**U.S. Cl. 229—48 R** **16 Claims**




Embossments in a folding carton blank near the edge at each side of the glue lap or side panel to which the gluing panel is connected, on the face of the glue lap or side panel, opposite the face whereon glue is applied, prevent the overrun of glue at each side of the glue lap from contacting the reverse face of the side panel which is contiguous with the gluing panel and the subsequent sealing of the non-glued face of the glue lap to such side panel when the sealing operation is completed.

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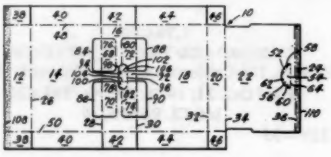
**3,744,709**
**CARTON HAND HOLE PROTECTION**

**Allardus A. Akkerman, Calgary, Alberta, Canada, assignor to Domtar Limited, Montreal, Canada**

**Filed Apr. 14, 1972, Ser. No. 244,076**
**Int. Cl. B65d 5/46**
**U.S. Cl. 229—52 BC** **6 Claims**



A hand hole protector comprising a central and a pair of end panels foldably interconnected and formed in the top wall of a carton. These panels are foldably connected to the remainder of the carton through the central panel whereby said protective panels can be folded into the carton to form an access opening. Folding of the panels to form an access opening causes the end panels to contact the tops of a pair of adjacent bottles and be folded relative to the central panel to protect the access opening on three sides.

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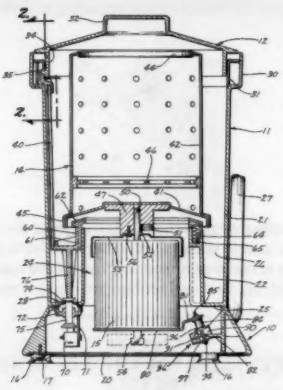
**3,744,710**
**SUPPORTING SYSTEM FOR CENTRIFUGAL EXTRACTOR AND MOTOR THEREFOR**

**Edward O. McCartney, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa**

**Filed Nov. 29, 1971, Ser. No. 202,795**
**Int. Cl. B04b 9/02**
**U.S. Cl. 233—24** **14 Claims**

A wedge member comprises a portion of a support system for mounting an operating assembly on a base and within a stationary housing of a centrifugal extractor and is selectively movable to effectively adjust the orientation of the operating assembly relative to the stationary housing. The wedge



member is formed by a generally diagonal slot cut into a slide block.

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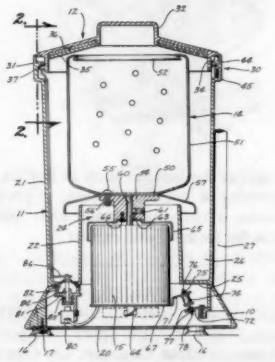
**3,744,711**
**BRAKE FOR CENTRIFUGAL EXTRACTOR**

**Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa**

**Filed Nov. 29, 1971, Ser. No. 202,949**
**Int. Cl. B04b 9/02**
**U.S. Cl. 233—24** **15 Claims**



An access lid of a centrifugal extractor includes a brake surface on the underside of the lid and is manually movable for interrupting motor energization and for effecting engagement of the brake surface with the rotatable fabric container to reduce the speed of the spinning container prior to removal of the lid from the housing.

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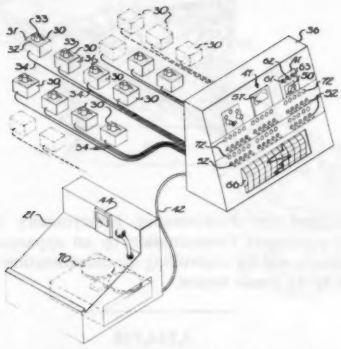
**3,744,712**
**PARTICIPATION PRESENTER-AUDIENCE REACTION SYSTEM**

**Demetrios Panagiotou Papadopoulos, 2216 West First Avenue, and Thomas Leslie Westbrook, W. 1004-18th, both of Spokane, Wash.**

**Filed June 12, 1972, Ser. No. 261,979**
**Int. Cl. G07c 13/00**
**U.S. Cl. 235—52** **8 Claims**

A system is described for measuring the response of selected members of an audience, averaging the selected responses and presenting the average to the presenter as the

presentation is being made to enable the presenter to adjust his presentation accordingly or respond to the audience response. The system includes a plurality of electrical response circuits having variable resistance manually operable devices individually distributable to the audience. Input resistors are included in each response circuit having resistance values at least 10 times greater than the maximum resistance of its variable resistance devices. The system includes switching means for placing selected response circuits in parallel with each other to a common line in series with an



operational amplifier. The system includes a plurality of feedback resistors corresponding to the response circuits with the corresponding feedback resistors being placed in parallel with the amplifier to provide an output signal from the amplifier equal to the average of the selected response signals. It is important that the total feedback resistance placed in parallel with the operational amplifier is substantially equal to the total resistance of the selected response circuits. The output signal is transmitted to a readout device at the presenter's console or lectern to provide the presenter with a continuous reading of the audience's reaction to his presentation.

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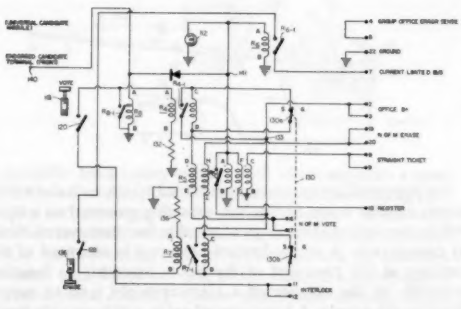
**3,744,713**
**VOTING MACHINE**

**Afton V. Martin; Michael T. Moldovan, both of Jamestown, N.Y.; Anatolijus Jazbutis, Sunnyvale, Calif.; Guy L. Fougere, Lincoln, Mass.; Donald B. Rising, Stow, Mass.; Gary C. Koger; Genio R. Arciprete, both of Lexington, Mass., and Noel Svendsen, Bedford, Mass., assignors to AVM Corporation, Jamestown, N.Y.**

**Filed Feb. 10, 1970, Ser. No. 10,264**
**Int. Cl. G07c** *13/00*
**U.S. Cl. 235—54 F** **11 Claims**



An electrically operated voting system having a plurality of voting machine stations and a central vote accumulating register. The voting machine and register are of modular construction and may be readily programmed to satisfy the requirements of general, open and closed primary, and other type elections. Each voting machine includes a number of interlock circuits which prevent a voter from selecting a number of condidates in excess of that permitted; and also prevent a voter from casting more than one vote for a respective candidate; yet permit that a voter may reconsider and cancel a selection already made and vote for another candidate of his choice. Additionally, each machine is substantially fail-safe in that it may not normally continue to operate should a malfunction occur, and, when a malfunction occurs, the election official is immediately made aware of it and no votes already cast and sought to be registered by a voter will be lost.

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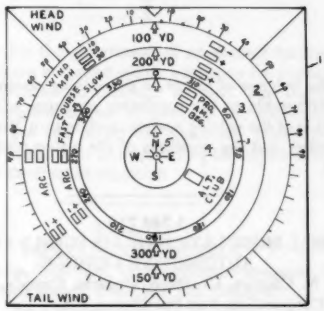
**3,744,714**
**GOLF COMPUTER MEANS**

**Philip M. Banner, 28 Oxford Road, Massapequa, N.Y.**

**Filed Dec. 7, 1971, Ser. No. 205,620**
**Int. Cl. G06c** *3/00*
**U.S. Cl. 235—88** **6 Claims**




A computer that converts distance and windage factors and trajectories for the player, having a base containing circular indicia, having four discs arranged upon it containing other indicia relating to a scientific approach to the game of golf. The discs are rotatable mounted together fastened to the base plate by means of a rivet or bolt. Specific readout windows have been provided for viewing information concerning where to hit a ball, what club to use, and having a compass dial, adjustments for a fast or slow course. The back of this computor contains a wind measuring means that also detects wind direction, a ground level dectector means and three rotatably mounted discs used to count strokes and holes for the players.

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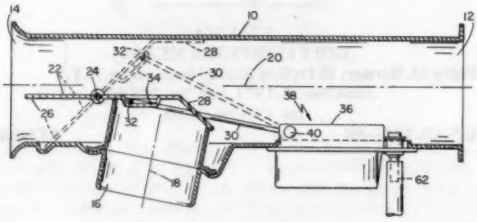
**3,744,715**
**PRESSURE OPERATED TEMPERATURE SENSOR ACTUATOR**

**Gerald E. Maddocks, Chatham, Ontario, Canada, assignor to Fram Corporation, East Providence, R.I.**

**Filed Feb. 23, 1972, Ser. No. 228,655**
**Int. Cl. F02m** *31/06*
**U.S. Cl. 236—13** **9 Claims**

Improvement in a system for controlling fluid temperature comprising a member movable between positions in which the temperature is respectively increased and decreased, and an actuator linked to the member and mounted to communicate with the fluid to adjust the position of the member in accordance with temperature changes in the fluid, the improvement being in the actuator, which comprises a housing; a diaphragm mounted in the housing to define a control

chamber therein, the diaphragm having a valving portion and having a piston portion linked to the member and mounted to reciprocate in the housing, to move the member between its positions, the housing having an opening on one side of the diaphragm for connection to a source of regulating pressure, the valving portion being adjacent the opening and movable between sealed and unsealed positions with respect thereto; and a temperature sensitive element mounted to apply force to the valving portion dependent upon the fluid temperature,




so that the balance of forces on the valving portion, including force attributable to the regulating pressure, will determine the position of the valving portion, and, in turn, the pressure in the chamber and the positions of the piston portion and the member.

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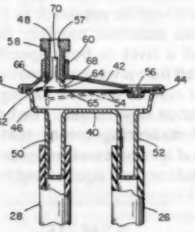
**3,744,716**

## THERMAL MODULATION OF AIR SUPPLY SYSTEM IN AUTOMOTIVE VEHICLE

**Herbert N. Charles, Chatham, Ontario, Canada, assignor to Fram Corporation, East Providence, R.I.**

**Filed Nov. 22, 1971, Ser. No. 200,926**
**Int. Cl. F02m *31/02*; B01d *39/10***
**U.S. Cl. 236—87** **5 Claims**



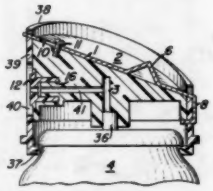

Temperature sensor for controlling air pressure in vacuum control line for thermally modulated air supply system in an automotive vehicle, featuring a temperature responsive element isolated from the atmosphere except through the control orifice and the air line in which pressure is being controlled; a free floating valve element supported against the control orifice from beneath by a bimetal strip, so that movement of the strip away from the orifice enlarges its effective opening; and a valved orifice-defining member adjustable toward and away from the bimetal strip for calibration.

**3,744,717**

## METHOD FOR DISPENSING LACHRYMATORY MATERIAL

**Joseph Kozub, Abingdon, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Division of Ser. No. 863,170, Oct. 2, 1969, Pat. No. 3,593,926.**
**This application Mar. 1, 1971, Ser. No. 120,032**
**Int. Cl. B05b *11/00***
**U.S. Cl. 239—1** **3 Claims**




A method for disseminating lachrymatory material to prevent premature dissemination by an apparatus having a safety means and for controlling the dissemination stream by a variable spray nozzle means.

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**3,744,718**

## LUMINESCENT AEROSOL MARKER

**Carl H. Morley, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 20, 1970, Ser. No. 48,591**
**Int. Cl. A01n *17/02***
**U.S. Cl. 239—8** **7 Claims**

A method for forming a 3-dimensional marker for long range detection which comprises releasing an aerosol spray into the atmosphere consisting of a mixture of compounds whereby the reaction of the mixture produces a marker of light visible from any angle.

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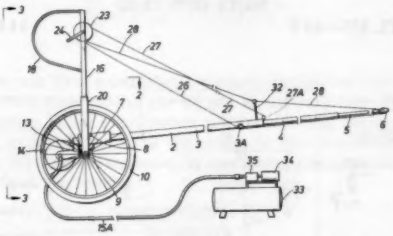
**3,744,719**

## PORTABLE LIQUID SPRAY ASSEMBLY WITH BOOM AND NOZZLE

**Sherwin Wallick, Houston, Tex., assignor to Jack L. Wallick, Columbus, Ohio, a part interest**

**Filed Oct. 20, 1971, Ser. No. 190,760**
**Int. Cl. B05b *9/02***
**U.S. Cl. 239—199** **10 Claims**



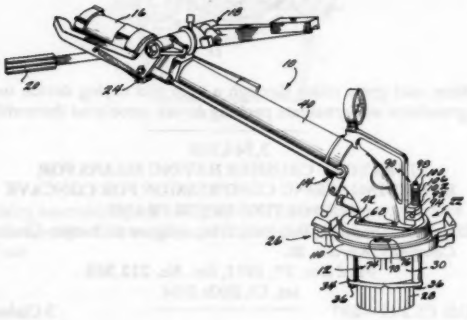

An improved spray means is provided which includes a telescopic tubular boom and nozzle assembly mounted on a lightweight two-wheeled carriage adapted to be maneuvered about by one person. A spring-loaded hose reel is mounted of the carriage at the base end of the boom assembly to function generally in the manner of a counterweight, and to supply liquid to the nozzle. A hand-wound cable reel is provided with three cables, one for actuating the nozzle, one to give stability to the extended boom, and one to extend the boom from its retracted condition.

3,744,720

## SPRINKLER HEAD WITH IMPROVED BRAKE AND BEARING ASSEMBLY

Larry P. Meyer, East Peoria, Ill., assignor to Nelson Irrigation Corporation, Brimfield, Ill.

Filed Mar. 28, 1972, Ser. No. 238,765
Int. Cl. B05b *3/08*
U.S. Cl. 239—231 10 Claims



A step-by-step rotary sprinkler head in which the brake mechanism for controlling the arcuate magnitude of the step-by-step movements is manually adjustable by turning a single threaded element to vary the pressure of frictional engagement of a pair of opposed arcuately segmental brake shoes with a ring shaped brake element.

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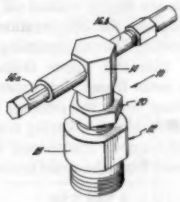
3,744,721

## ROTARY SPRINKLER

Leopold Baumstark, Jr., 37980 Vineland Avenue, Beaumont, Calif.

Filed Sept. 10, 1971, Ser. No. 179,461
Int. Cl. B05b *3/06*; F16l *17/00*
U.S. Cl. 239—261 9 Claims



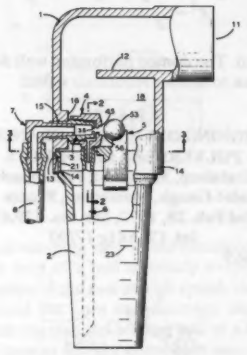
A sprinkler has a rotary tubular shaft which supports a cross head and nozzle tubes. The shaft is journaled in a housing having a top surface engaged with the undersurface of the cross head when the shaft is stationary. The cross head has a protective skirt for preventing entry of water between the surfaces. Associated with the lower end of the shaft is a combination thrust and radial bearing system and a seal through which water flows and which flexes in response to water pressure to effectively seal the bearing system against the entry of water and to thrust apart the cross head and the housing to make for easier turning and longer life of the sprinkler.

3,744,722

## NEBULIZER

Henry L. Burns, Beaverton, Oreg., assignor to Cavitron Corporation, Long Island, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,327
Int. Cl. B05b *7/24*
U.S. Cl. 239—338 8 Claims



A nebulizer for the generation of an aerosol having three major components mounted within a housing for containing a liquid and directing the resultant aerosol. The three components are designed for ease in assembly and disassembly for cleaning. The gas and liquid are uniformly mixed prior to depositing the liquid onto and spreading the liquid over a target surface for the final atomization.

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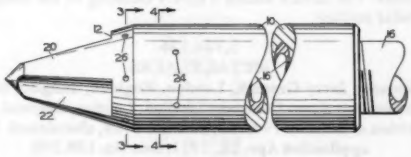
3,744,723

## PIPE CLEANING NOZZLE

Donald W. Davis, 9500 N.E. 72nd Avenue, Vancouver, Wash.

Filed June 5, 1969, Ser. No. 830,656
Int. Cl. B05b *1/26*; F23d *11/36*
U.S. Cl. 239—543 3 Claims



The front end of a pipe cleaning nozzle body has a plurality of peripherally spaced fluid pressure jet ports therethrough arranged on axes which converge forwardly about a forwardly projecting tip to provide fluid pressure jets for dislodging solids accumulations in the pipe. Additional fluid pressure jet ports extend outward through the side of the body on axes which diverge angularly rearward to provide fluid pressure jets which assist forward movement of the nozzle and rearward expulsion of solids removed from the pipe.

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3,744,724

## AIR DISTRIBUTING CHANNEL

Charles Caille, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Mar. 24, 1972, Ser. No. 237,687
Int. Cl. B05b *1/30*
U.S. Cl. 239—553.5 7 Claims

Air is distributed uniformly and at reduced outflow speed from the outlet of the channel. The perforated inner wall defines an air passage of linearly decreasing cross-section with

the channel bottom to uniformly distribute the air. The next perforated wall defines a partitioned turbulence space to

reduce air speed. The domed perforated wall defines a second turbulence space to further reduce air speed.

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**3,744,725**

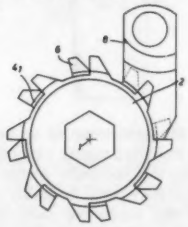
**PROPORTIONING DEVICE FOR GRANULATED OR PULVERULENT PRODUCTS**

**Xavier Roger Grataloup, Monterau, France, assignor to Societe Anonyme: Nodet-Gougis, Montereau, France**

**Filed Feb. 28, 1972, Ser. No. 229,692**

**Int. Cl. A01c *17/00***

**U.S. Cl. 239—669** **8 Claims**



The invention has for object a proportioning device for granulated or pulverulent products, said device is fitted with a spigot cylinder and in which, on the one hand the various spigots are connected to the cylinder on a portion only of their width, so that a ring-shaped section is provided between any pair of adjacent spigots and the cylinder body, the width of this section approximating the active one of each spigot, and in which on the second hand the fixed fingers have a free tip such as to extend through the said ring-shaped sections up to the immediate vicinity of the peripheral surface of the rotating cylinder. The device allows a surely cleaning of the complete cylinder surface.

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**3,744,726**

**METAL FLAKES**

**Aleksander Jerzy Groszek, London, England, assignor to The British Petroleum Company Limited, London, England**

**Division of Ser. No. 794,757, Jan. 26, 1969, abandoned. This application Apr. 28, 1971, Ser. No. 138,298**

**Int. Cl. B02c *19/16***

**U.S. Cl. 241—30** **9 Claims**

Ultra-fine flakes which have grease-thickening properties are formed by grinding metals in an organic liquid in a vibratory grinding mill having an amplitude of vibration of at least 2mm and a frequency vibration of at least 1,000 cycles per minute.

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**3,744,727**

**DEVICE FOR REGENERATING FOIL WEBS OR FOIL STRIPS INTO A GRANULATE**

**Heinrich Koch, Jakobstr. 88, 52 Siegburg, Germany**

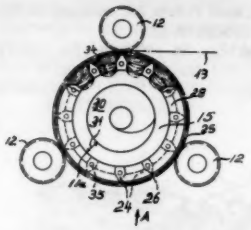
**Filed Mar. 4, 1971, Ser. No. 120,868**

**Claims priority, application Germany, Mar. 16, 1970 P 20 12 344.8**

**Int. Cl. B02c *19/00***

**U.S. Cl. 241—93** **3 Claims**

An apparatus for regenerating foil webs and foil strips to granulates, which comprises an extruder having its inlet fixedly connected to a funnel-shaped supply container and also having an outlet into which extends a worm with agitator, said worm tapering toward the interior of said extruder. Above said supply container there is arranged a grate roller and counter roller cooperating therewith for receiving material to be regenerated and diminuting said material and conveying it to said extruder, which in its turn passes the material received



from said grate roller through a bath and drying device to a granulator and granulate packing device associated therewith.

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**3,744,728**

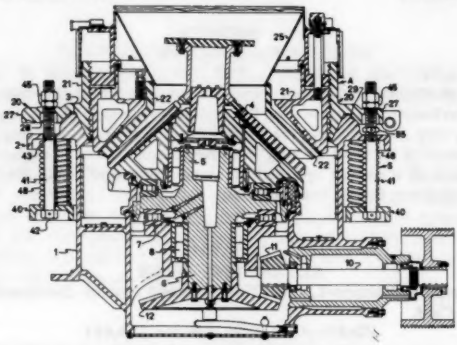
**GYRATORY CRUSHER HAVING MEANS FOR RETAINING SPRING COMPRESSION FOR CONCAVE SUPPORTING UPPER FRAME**

**Eugene A. Treppish, Belgium, Wis., assignor to Barber-Greene Company, Aurora, Ill.**

**Filed Dec. 27, 1971, Ser. No. 212,369**

**Int. Cl. B02c *2/04***

**U.S. Cl. 241—207** **3 Claims**



A gyratory crusher of the type having a pair of crushing members such as a generally concial shaped head and a cooperating concave which surrounds the head to form an annular crushing chamber therewith. The concave and its supporting upper frame are spring loaded on the main frame and in a downward direction for cooperation with the crushing head. Means are provided for maintaining the compression in the springs which bias the upper frame and its concave downwardly on the main frame, this means being shiftable to an inoperative position while the crusher is operative and the means then being shiftable to a spring compression retaining position whereby the upper frame and its concave can be detached and removed from the main frame.

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**3,744,729**

**FOOD GRINDER**

**Frank M. Ackerman, Route 2, Box 1760, Auburndale, Fla.**

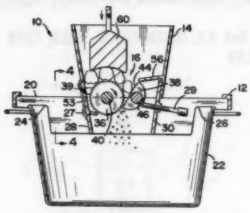
**Filed Apr. 7, 1971, Ser. No. 131,915**

**Int. Cl. B02l *4/10***

**U.S. Cl. 241—239** **6 Claims**

A grinding device for grinding or cutting food of various varieties comprising a support frame member which is formed to mount on a detachable collector or receptacle. A cutting assembly is detachably mounted to the support frame member and includes a rotatable cylindrical cutting element and an adjustable cutting element which co-act to cut or grind food to a selected size. The cylindrical cutting element includes an elongated shaft for mounting of a detachable crank handle which when rotated imparts a rotational movement to the cylindrical cutting element thereby creating the grinding action. A

removable hopper for introducing the food to the cutting assembly is secured on top of the support frame and over the



cutting assembly by a locking device. An indicator cooperates with the adjustable cutting element to indicate the desired size of cut.

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**3,744,730**

**KNIFE ASSEMBLIES FOR WINDING MACHINES**

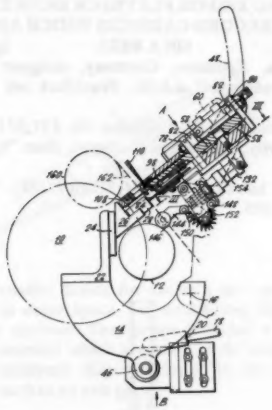
**David Burnage, Bromham, England, assignor to John Disenberg Company, Inc., Clifton, N.J.**

**Filed Nov. 15, 1971, Ser. No. 198,850**

**Claims priority, application Great Britain, Nov. 16, 1970, 54,453/70**

**Int. Cl. B65h** *19/26*

**U.S. Cl. 242—56 A** **12 Claims**



A knife assembly for cutting strip material such as plastics film or tape during a winding operation whereby the trailing end of the severed strip is wrapped onto the completed reel and the leading end of the severed strip is wrapped on to a new core.

Preferably, a backing member is movable into a position behind the strip, a knife or knives are moved into engagement with the strip and then transversely of the strip to effect the cutting action, brush means wraps the trailing end on to the completed reel, and roller means wraps the leading end on to a new core.

**3,744,731**

**REED FOR TAPE OR THE LIKE**

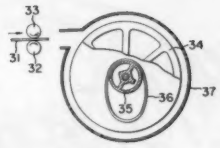
**Hisanori Ataka, Kawaski, and Hiroshi Yamada, Ichikawa, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Nov. 4, 1971, Ser. No. 195,654**

**Claims priority, application Japan, Jan. 14, 1971, 46/655**

**Int. Cl. B65h** *75/28*

**U.S. Cl. 242—74** **9 Claims**



A flexible tape-catching ring whose circumference is longer than that of the core of a reel is loosely wrapped around the core. Upon rotation of the reel at high speed, the catching ring is revolved around the core and becomes elongated due to centrigugal force to catch the leading end of a tape or the like and to wind the tape or the like around the core.

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**3,744,732**

**VEHICLE SEAT BELTS AND HARNESSES**

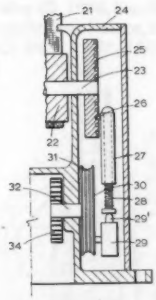
**John Edward Fowler, Abingdon, England, assignor to Pressed Steel Fisher Limited, Cowley, Oxford, England**

**Filed July 20, 1971, Ser. No. 164,333**

**Claims priority, application Great Britain, July 29, 1970, 36,614/70**

**Int. Cl. A62b** *35/00*

**U.S. Cl. 242—107 SB** **4 Claims**

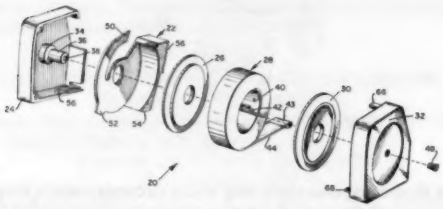


A vehicle seat belt or harness is connected to an inertia-locking spool that includes switch means operated when a predetermined amount of belt is withdrawn from the spool such as occurs when the belt is correctly worn. The switch may be connected to energize an alarm, or to immobilize the vehicle, if an attempt is made to start the vehicle, or drive it at above a certain speed, without sufficient belt having been withdrawn. The switch may be operated either by the belt or harness that is wound around the spool, or by the rotation of the spool itself as belt or harness is unwound therefrom. The operation of the switch may also be controlled by the position of a vehicle seat with which the belt is associated to alter the predetermined amount of belt that must be withdrawn and thereby compensate for fore and aft adjustment of the seat.

3,744,733
**POWER TAPE UNITS AND LOCKING AND RELEASING DEVICE THEREFOR**

Robert A. Bennett, Shelton, Conn., assignor to Waterbury Lock & Specialty Co., Milford, Conn.

Filed Feb. 19, 1971, Ser. No. 116,924
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.3 8 Claims



A unitary plastic piece performing as a biasing spring, lock and finger-controllable button is installed in a conventional power tape case and maintains the powered measuring tape locked in any extended or non-extended position. The measuring tape is released by pushing the incorporated button to compress the biasing spring portion and release the brake.

3,744,734
**TUBULAR DRUM PAYOUT**

Peter Lodato, St. Louis, and Eugene W. Steffens, Bridgeton, both of Mo., assignors to General Cable Corporation, New York, N.Y.

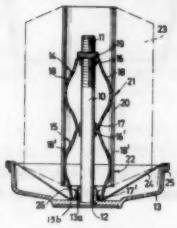
Filed Oct. 13, 1971, Ser. No. 188,810
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 11 Claims

A wire payout assembly that fits over the upper end of a drum of wire to prevent coils and groups of coils that come out of the drum from reaching a wire winding machine. The wire leaves the drum along an inner cone that holds loops of wire substantially horizontal as they unwind. Successively smaller diameter turns of tubing in an outer cone cause any groups of coils to pull apart into individual coils that unwind more easily. Guiding means at the top of the outer cone lead the wire to a winding machine or other use location.

3,744,735
**ADJUSTABLE SUPPORT FOR BOBBINS**

Alfred Koenig, Seb. Weilerstr. 3, Belsen/Kreis, Tuebingen, Germany

Filed Aug. 26, 1971, Ser. No. 175,097
Claims priority, application Germany, Sept. 25, 1970, P 20 47 214.4
Int. Cl. B65h *49/02*; D03j *5/08*
U.S. Cl. 242—130 8 Claims



An adjustable support for bobbins comprising a spool holder, a shaft and a plurality of holding devices. The holding devices are of such shape and are so mounted as to permit the support of cylindrical as well as conical bobbin tubes of different diameters.

3,744,736
**RECORDING AND/OR PLAYBACK DEVICE HAVING TAPE-TYPE RECORD CARRIERS WHICH ARE WOUND ON A REEL**

Jurgen Kruhn, Konstanz, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 28, 1971, Ser. No. 157,371
Claims priority, application Germany, June 29, 1970, P 70 24 281.8
Int. Cl. G03b *1/04*; G11b *15/32*
U.S. Cl. 242—195 13 Claims

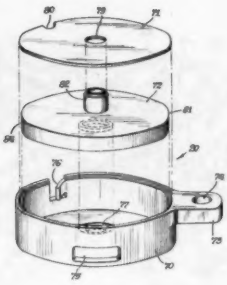
A system including a tape reel containing a length of tape whose leading end can be fed out of the reel by rotation of the reel and a recording and/or playback instrument for guiding the leading end onto a takeup reel, the tape having a stiff, resilient leader tape arranged to bear against peripheral surfaces of the reel flange, the surfaces being inset radially from the outer flange extremity, and at least part of the leader tape having a normal curvature such that it presses against the peripheral surfaces.

3,744,737

## FILM CASETTE

Ray C. Anderson, 3905-E. 67th Street, Tulsa, Okla.

Division of Ser. No. 806,619, March 12, 1969, Pat. No. 3,687,560. This application Apr. 5, 1971, Ser. No. 131,163
Int. Cl. G03b 23/02
U.S. Cl. 242—197 3 Claims



A film casette for use in an automatic film feeding projector, the casette being constructed so that the projector mechanism may cooperate therewith to automatically unwind and rewind the film in the casette.

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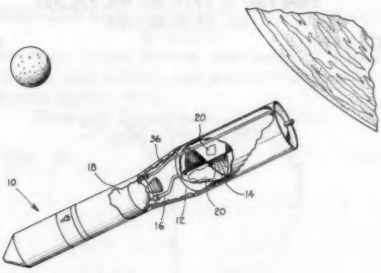
3,744,738

## ZERO GRAVITY LIQUID TRANSFER SCREEN

Frank S. Howard, Indian Harbor Beach, Fla., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 16, 1971, Ser. No. 180,963
Int. Cl. B64c 39/00
U.S. Cl. 244—1 SS 2 Claims



A liquid transfer device for use in a zero gravity environment, such as outer space, for transferring liquid from one container to another. The device includes a spiral shaped screen type member which is carried in the container for collecting the randomly dispersed liquid in the container and transferring such to an exit port.

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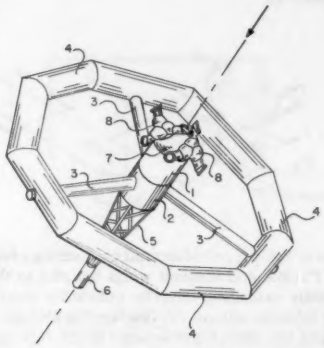
3,744,739

## MULTIPLE IN-LINE DOCKING CAPABILITY FOR ROTATING SPACE STATIONS

Leon B. Weaver, and Claude D. Pegden, Huntsville, Ala., assignors to The United States of America as represented by the Administration of the National Aeraonautics and Space Administration, Washington, D.C.

Filed Apr. 12, 1972, Ser. No. 243,374
Int. Cl. B64g 1/00
U.S. Cl. 244—1 SD 8 Claims

The invention comprises means for hard docking a number of space vehicles with a rotating space station, and includes an axially positioned dome on which are located two intermeshing docking turrets. Each turret carries multiple docking ports extending radially from the turret axis, along which axis final access to the space station is accomplished through the turret hub. The turrets intermesh and rotate about their hubs, by means of a power source and suitable ring gears and bevel



pinions, to successively position one of the docking ports on the axis of rotation of the space station, while the remaining ports are positioned off center, and alternately rotated into such docking position to receive an additional space craft. The arrangement allows docking in-line with the axis of rotation of the station, and multiple vehicles to be thus docked and then placed in holding position.

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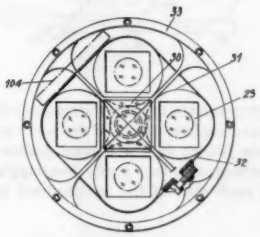
3,744,740

## HIGH PRECISION STELLAR POINTING DEVICE FOR SPACECRAFT

Pascal Albert Godin, Chilly-Mazarin; Guy Henri Seite, Paris; Bertrand Georges Dupont, Boulogne, and Max Laurent Vidal, Chevilly-Larue, all of France, assignors to Societe Anonyme D'Etudes et Realisations Nucleaires Sodern, Suresnes, France

Filed May 22, 1970, Ser. No. 39,762
Claims priority, application France, May 23, 1969, 6916884
Int. Cl. F42b 15/02, 15/10, 15/00
U.S. Cl. 244—3.19 12 Claims



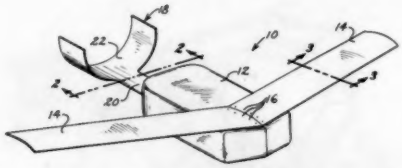
A navigation apparatus for a stellar vehicle includes a support within the vehicle on which a pair of stellar detectors are fixedly mounted with their respective optical axes directed to different stars. Generators connected respectively with the detectors produce data corresponding to the error between the trajectory being followed by the vehicle and the directions of the stars, and processor means connected to the outputs of the generators function to compute the error data and deliver the necessary course correction signals to the propulsion and direction control system to the vehicle.

3,744,741

## FOLDABLE AIRCRAFT

Robert D. Christian, Tustin, and Michael F. Steele, Costa Mesa, both of Calif., assignors to Celesco Industries, Inc., Costa Mesa, Calif.

Filed June 8, 1971, Ser. No. 151,050
Int. Cl. B64c 3/56
U.S. Cl. 244—16 11 Claims



A glider or self-propelled aircraft comprising a fuselage, and a pair of flexible and resilient wings secured to the fuselage and normally extending laterally outwardly therefrom. The wings are foldable around the fuselage for storage. A flexible and resilient tail assembly is secured to the fuselage and normally extends rearwardly therefrom. The tail assembly is foldable onto the fuselage and over the folded wings for storage. In operation, the wings and tail assembly are releasably held in folded condition around the fuselage by any suitable means which is released upon deployment of the glider or aircraft to enable the wings and tail assembly to unfold owing to their own resiliency.

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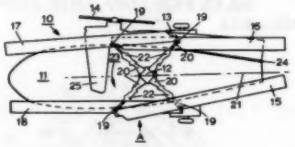
3,744,742

## ROTARY WING AIRCRAFT WITH FOLDING ROTOR BLADES

John Philip Gear, Thornford near Sherborne, England, assignor to Westland Aircraft Limited, Yeovil, Somerset, England

Filed Nov. 29, 1971, Ser. No. 202,971
Claims priority, application Great Britain, Dec. 18, 1970, 60,300/70
Int. Cl. B64c 27/50
U.S. Cl. 244—17.11 2 Claims



The invention relates to rotary wing aircraft having at least one four-bladed rotor system and discloses means for folding the four rotor blades into a stowed position in which the blades are arranged in two partly overlapping pairs located one pair on each side of the longitudinal centreline of the fuselage.

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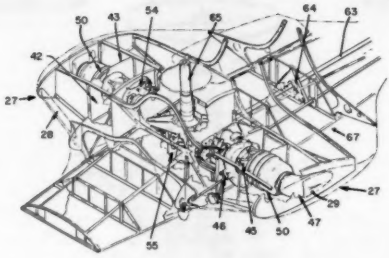
3,744,743

## HELICOPTER POWER PLANT SYSTEM

Harvey O. Nay, Palos Verdes Estates; Frank S. Okamoto, Torrance; Robert E. Head, Palos Verdes Estates; Richard E. Moore, Los Angeles, and John M. McDermott, Torrance, all of Calif., assignors to Gates Learjet Corporation, Wichita, Kans.

Filed Sept. 11, 1970, Ser. No. 71,319
Int. Cl. B64c 27/12
U.S. Cl. 244—17.11 12 Claims

Two turbine engines power the craft. They are positioned at the main rotor hub region just above the cabin. Each engine extends laterally, cross-ship. A simplified transmission/gearing system results. Also, should one engine fail, the other readily takes over alone. A nacelle encloses each lateral engine, in the form of a stub wing. The nacelles are set at a positive incidence angle, and provide a substantial lift that unloads the main rotor and saves in the overall horsepower requirement.



They are of relatively small down area, to minimize downloading due to rotor downwash. Their leading edge has an inlet slot for engine air. The exhaust ports are in their outboard edges to direct the noise and hot gases away from the craft. The wing-like nacelles are symmetricaly arrayed, and aerodynamically as well as esthetically integrated with the helicopter.

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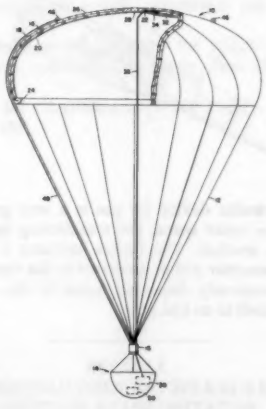
3,744,744

## PARABALLOON

Bernie J. Cobb, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 2, 1972, Ser. No. 231,335
Int. Cl. B64b 1/48
U.S. Cl. 244—32 6 Claims



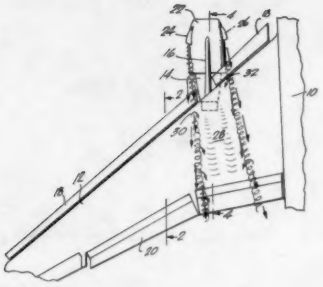
A paraballoon for use as a recovery aid in finding missile carried instruments. The paraballoon will act as a radar reflective parachute for controlled descent, but converts to a balloon upon impact for aid in recovery. A canopy forms the upper portion of the parachute and is adapted to form a chamber therein. Upon impact an acceleration responsive actuator causes release of gas to inflate the chamber and convert the canopy into a balloon for use as a recovery aid.

3,744,745

## LIFTVANES

Richard Kerker, Los Angeles, and Otis D. Wells, Lakewood, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Sept. 30, 1971, Ser. No. 185,338
Int. Cl. B64c 5/06
U.S. Cl. 244—41 6 Claims



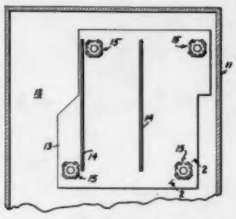
A set of lifting vanes attached to the sides of a body which protrudes forward from beneath the wing of an aircraft. The vanes are shaped and located to produce a significant downwash field contribution in the region of the wing leading edge aft of the protuberance.

3,744,747

## RESILIENT SUPPORT

Richard E. Busch, Hacienda Heights, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed May 15, 1972, Ser. No. 253,499
Int. Cl. B62d 23/00
U.S. Cl. 248—22 11 Claims



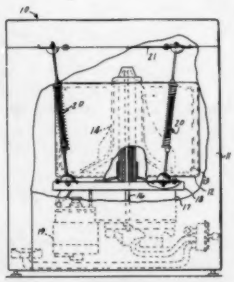
A vibration absorbing support comprising a base having an upstanding post and a concentrically arranged flange surrounding the post with radially extending upstanding ribs therebetween. An annular elastomeric bushing is slidably fitted between the post and the flange and rests on the ribs. The bushing supports a base for a vibrating apparatus in such a manner that the elastomeric material is subjected to a shearing force in a vertical direction and a compressive force in a horizontal direction to permit a maximum amplitude of movement vertically and a restricted horizontal movement.

3,744,746

## SUSPENSION ROD ASSEMBLY FOR AUTOMATIC WASHER

Robert M. Weir, Benton Harbor, and Gerald K. Farrington, Saint Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 23, 1971, Ser. No. 183,082
Int. Cl. F16f 15/00
U.S. Cl. 248—18 10 Claims



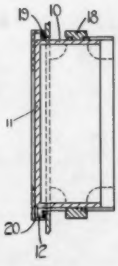
A tube suspension system in a laundry appliance includes individual suspension assemblies each including a pair of hanger rods interconnected in axially adjustable assembly and preloaded in a direction opposite to the suspension loading by a coiled compression spring. The hanger rods are coupled and guided for parallel movement by an elongated, substantially cylindrical unit.

3,744,748

## INSTRUMENT CASE FOR MOUNTING ON A PANEL

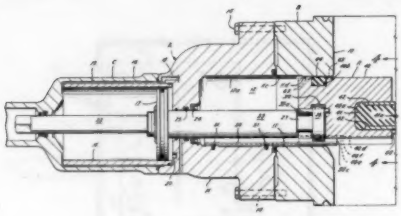
Maurice Harrold, Warley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 14, 1970, Ser. No. 97,966
Claims priority, application Great Britain, Dec. 15, 1969, 60,976/69
Int. Cl. G12b 9/10; F16l 41/00
U.S. Cl. 248—27 4 Claims



An instrument casing has a flanged body with a flange at one end. The side wall of the body has recesses which define inclined ramp surfaces. A flexible clamping ring with inward projections having inclined end surfaces is engaged with the body to clamp it to a panel and these end surfaces and the interengaged ramp surfaces are undercut to prevent outward flexing of the ring.

3,744,749
**BLOWOUT PREVENTER WITH RAM SUPPORT AND GUIDE MEANS**
**Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company, Houston, Tex.**
**Filed May 18, 1971, Ser. No. 144,556**
**Int. Cl. E21b *33/06***
**U.S. Cl. 251—1** **11 Claims**



A blowout preventer having new and improved means for supporting and guiding each ram in its travel to and from the open and closed positions whereby more uniform support, anti-cocking, and anti-heeling of the ram during such travel are accomplished.

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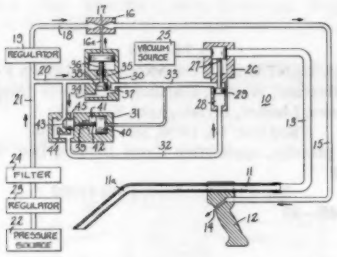
3,744,750
**FLUIDIC CONTROL FOR FLUID SYSTEMS**
**Harold F. Chamberlain, New Haven, Conn., assignor to Jarvis Corporation, Middleton, Conn.**
**Filed Jan. 10, 1972, Ser. No. 216,564**
**Int. Cl. F16k *31/12***
**U.S. Cl. 251—28** **6 Claims**




A fluidically controlled fluid system in which a fluid source is operated in a first line when static pressure is established in a second line.

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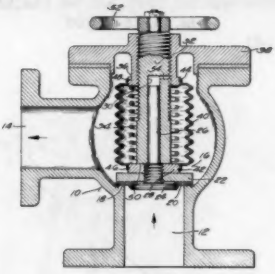
3,744,751
**CHECK VALVE**
**Daniel T. Robinson, Oak Creek, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.**
**Filed Oct. 21, 1971, Ser. No. 191,420**
**Int. Cl. F16k *31/50***
**U.S. Cl. 251—276** **4 Claims**

Flow from the inlet to the outlet of the valve is controlled by a spring-loaded check valve cooperating with a seat. The check valve has an annular valve face (made from a temperature-resistant, abrasion-resistant material and carried in a recess in a holder) and a stem guided in a bore provided in an adjustable spindle. The bottom end of the spindle acts as a stop limiting the valve travel upon opening. The opening travel of the check valve can be varied by adjusting the spindle position and flow can be shut off completely by bottoming the spindle against the check valve so it cannot open. A bellows surrounding the spring and spincle isolates the spring and stem guide from the flow system, thereby preventing excessive wear and gumming caused by the presence of the dry bulk material (when used in this type service) and other system contaminants in the moving parts of the valve. The stem guide is vented to the atmosphere to prevent a dash pot effect when the check valve opens.



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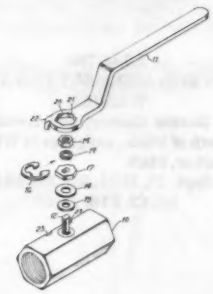
3,744,752
**DETACHABLE HANDLE FOR CONTROL DEVICES**
**Roger G. Massey, Holden, Mass., assignor to The Parker & Harper Mfg. Co., Inc., Worcester, Mass.**
**Filed Nov. 17, 1971, Ser. No. 199,596**
**Int. Cl. F16k *31/60***
**U.S. Cl. 251—292** **9 Claims**



A handle for a rotary control device, such as a valve, is secured to the control stem by a spring clip independent of any other fastening device for securing the stem assembly. Removal of the spring clip permits the handle to be stored separately for security against undesired operation of the control device.

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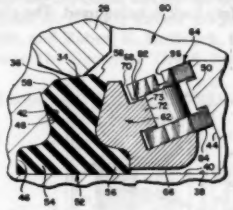
3,744,753
**SEAT ADJUSTMENT FOR BUTTERFLY VALVE**
**Kent S. Clow, Jr., Lake Forest, Ill., and Carter C. Crookham, Oskaloosa, Iowa, assignors to Clow Corporation, Oak Brook, Ill.**
**Filed Aug. 11, 1971, Ser. No. 170,922**
**Int. Cl. F16k *1/228***
**U.S. Cl. 251—307** **16 Claims**

A butterfly valve is disclosed which includes a valve disc and a ring defining a valve disc seat, the ring being capable of expanding radially to permit adjustment of the position of the seat. A plurality of segments are disposed adjacent the ring and chocks including at least two sets of opposed surfaces

bear against the segments. The effective distance between the surfaces of each set of chocks is different so that the effective



width of the chock varies depending upon which set of surfaces are in engagement with the segments and the valve body.

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**3,744,754**

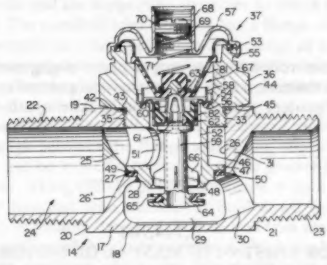
**MANIFOLD ARRANGEMENT AND PARTS THEREFOR OR THE LIKE**

**Roy C. Demi, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.**

**Continuation of Ser. No. 25,037, April 2, 1970, abandoned. This application Jan. 20, 1972, Ser. No. 219,445**

**Int. Cl. F16k *43/00***

**U.S. Cl. 251—363** **5 Claims**



A manifold arrangement for a fuel burning apparatus, the manifold arrangement interconnecting a source of fuel to the burner means thereof. A manifold fitting is disposed between the fuel source and the burner means and has passage means therethrough through which the entire fuel flow must pass to reach the burner means. The manifold fitting has a transverse opening therein leading from the exterior thereof to the passage means. A self-contained pressure regulator is received in the opening, the regulator having a housing that closes the opening and intersects the passage means of the manifold fitting in such a manner that the entire fuel flow through the fitting passes through the regulator housing and is thus under the control of the pressure regulator. When the regulator is removed or is not to be included in the arrangement, a plug is utilized to close the opening of the fitting.

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**3,744,755**

**GLASS BALL VALVE**

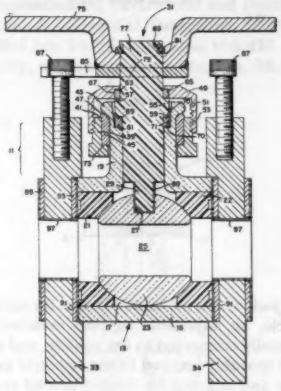
**Rex I. Gary, Jr., Swarthmore, Pa., and Charles Alden Kille, Vineland, N.J., assignors to Glastron, Inc., Vineland, N.J.**

**Filed Apr. 27, 1972, Ser. No. 248,036**

**Int. Cl. F16k *5/02, 5/06***

**U.S. Cl. 251—309** **4 Claims**

A glass ball valve comprising a glass body member having a cylindrical sidewall forming a passageway, a cylindrical glass bonnet extending from the cylindrical sidewall of the body member, a pair of mounting rings forming a seat with one positioned inside the body member at each end thereof, a glass valve ball seated in said pair of mounting rings and having a fluid passageway therethrough, a stem positioned in said bonnet, said stem having a flat keying end which keys into a slot in the ball so that rotation of the stem causes rotation of the ball, a pair of end flanges with one positioned at each end of the body member, bolts connecting the end flanges together and exerting pressure on the mounting rings and the ball, a coupling insert positioned around said bonnet and having an upwardly facing end, an outwardly extending lip or bead formed on the upper end of the bonnet which acts as a stop to limit upward movement of said coupling insert, a resilient split ring positioned between the coupling insert and the bonnet and having an upwardly and outwardly flaring flange which is positioned between said upwardly facing end of the coupling insert and said lip of the bonnet, a coupling cap positioned



around said coupling insert, threads connecting the coupling cap to the coupling insert for moving them toward and away from each other, a collar formed on said stem with an upwardly facing shoulder and a downwardly facing shoulder, an upwardly facing shoulder formed inside the bonnet for limiting the downward movement of said downwardly facing stem shoulder, a downwardly facing shoulder formed in the coupling cap, said upwardly facing stem shoulder limiting the downward movement of said coupling cap shoulder, an upper resilient ring of Teflon or the like seated between said upwardly facing stem shoulder and said downwardly facing coupling cap shoulder, and a lower resilient ring of Teflon or the like seated between said downwardly facing stem shoulder and said upwardly facing bonnet shoulder for sealing between said stem and bonnet.

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**3,744,756**

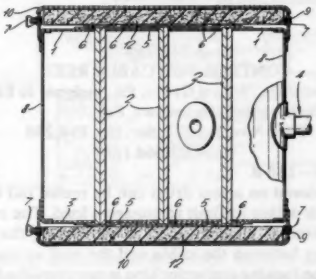
**LIFTING MEANS**

**Robert Leonard Mastyn Smith, Cardiff, Wales, assignor to M.F.C. Survival Limited, Rhondda, Glamorganshire, Wales**

**Filed Aug. 2, 1971, Ser. No. 168,146**

**Int. Cl. B66f *3/24***

**U.S. Cl. 254—93 HP** **8 Claims**



The invention relates to an inflatable bag which is used for lifting vehicles which are involved in a crash or in shoring

earth works and is particularly suitable were the ground is soft or in icy or snowy conditions. The lifting bag is of strong reinforced neoprene, the reinforcements being a system of webbings.

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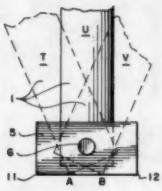
**3,744,757**
**VEHICLE JACK**
**Bobbie L. White, 6615 Canal Boulevard, and James L. Sanders, 3508 Penick, both of Shreveport, La.**
**Filed Mar. 8, 1971, Ser. No. 122,113**
**Int. Cl. B66f 7/22**
**U.S. Cl. 254—94** **4 Claims**




A vehicle jack which includes a means for securing the jack to the vehicle, an adjustable support member, one end of which is pivotally connected to the vehicle, and a ground contact member movably secured to the opposite end of the support member and adapted for limited pivotal movement with respect to the support member.

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**3,744,758**
**LEVER AND FULCRUM COMBINATION**
**Harold Y. Nakasone, 91-336 Papipi Road, Ewa Beach, Hawaii**
**Filed Dec. 1, 1970, Ser. No. 94,087**
**Int. Cl. B66f 3/00**
**U.S. Cl. 254—129** **6 Claims**

This invention is for special fulrum means for crowbars and the like. The fulcrum comprises ring-like means which slide onto and along the shaft of a crowbar so that the fulcrum can be useful at either end of the crowbar.

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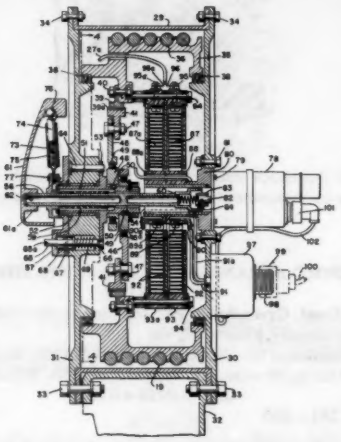
**3,744,759**
**CONTROL FOR CABLE REEL**
**Arthur F. Jennings, Willow Grove, Pa., assignor to Eastern Rotorcraft Corporation, Doylestown, Pa.**
**Filed Nov. 1, 1971, Ser. No. 194,298**
**Int. Cl. B66d 1/30**
**U.S. Cl. 254—150 R** **14 Claims**

A cable stored on a reel drum can be reeled out to any adjusted length within its limit to engage a load. The reel is supplied with control mechanism to allow locking the drum for load transfer between the cable and the reel at any adjusted position. The locking and unlocking is accomplished either by remote electrical control or by mechanical (manual) control at the reel. A manually operated safety lock located on the reel housing prevents inadvertent release of the locking mechanism during load carrying operations. Engagement of the safety lock automatically disconnects the electrical control while the safety lock is being used. The electrical actuator



clutch is controlled to give proper phase engagement for correct synchronization with the mechanical control operation as well as to protect against undesired backdrive into the actuator.

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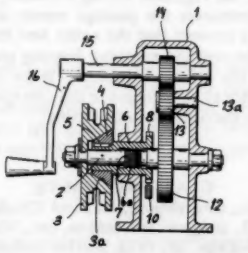
**3,744,760**
**ANCHOR HOIST WITH MANUAL OR MOTOR DRIVE**
**Edmond Uher, Zug, Switzerland, assignor to Uher Patent AG, Zug, Switzerland**
**Continuation-in-part of Ser. No. 101,287, Dec. 24, 1970. This application May 1, 1972, Ser. No. 249,133**
**Claims priority, application Germany, Apr. 29, 1971, P 21 21 017.3**
**Int. Cl. B66d 1/00**
**U.S. Cl. 254—187 R** **10 Claims**



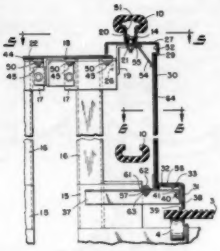

An anchor hoist with manual and/or motor drive in which the winch drum is rotatable upon its shaft and is coupled therewith by a servo-tightened cone-type clutch driven axially by a mechanism cooperating with a sleeve carried by the shaft. The tubular member or sleeve is provided with locking means for retaining it against rotation as the shaft is rotated and includes a camming arrangement for lifting a detent holding the sleeve against rotation.

3,744,761

## BALUSTRADE CONSTRUCTION

Roy A. Chervenic, Akron, Ohio; Gerald M. Glaser, Arlington Heights, Ill.; John H. Hewitt; Ernest D. Johnson, both of Tallmadge, Ohio, and Robert K. Rothrock, Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 24, 1971, Ser. No. 183,403
Int. Cl. E04h *14/17*
U.S. Cl. 256—24 16 Claims



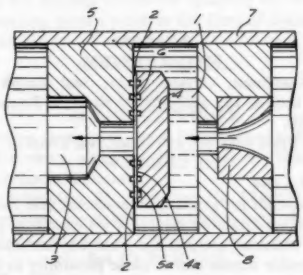
An enclosed balustrade with no exposed fasteners having a handrail trim member along the top, sandwiched between a handrail guide and the supporting structure to which the guide is fastened. The handrail trim member has a flange at the side of the balustrade for overlapping the upper edge of a removable panel supported in a groove of a toe trim member at the lower edge. A spring clip inside the balustrade holds the panel against the flange of the handrail trim member and permits removal and installation of the panel by upward movement of the upper edge between the flange and spring clip so that the lower edge can be moved into and out of the groove in the toe trim member. Along the top of the balustrade, a deck member next to the handrail trim member is held down by another downwardly extending flange of the handrail trim member engaging the surface of the deck member. Splices are located at spaced-apart positions along the balustrade with fasteners secured from the inside of the balustrade and underlying or overlying splice members covering the joints between the covering components.

3,744,762

## HOMOGENIZING METHOD AND APPARATUS

Werner Schlicht, Hamburg, Germany, assignor to Alfa-Laval Bergedorfer Eisenwerke GmbH, Hamburg, Germany

Filed Sept. 17, 1971, Ser. No. 181,364
Claims priority, application Germany, Sept. 19, 1970, P 20 46 326.7
Int. Cl. B01f *5/08*
U.S. Cl. 259—4 7 Claims



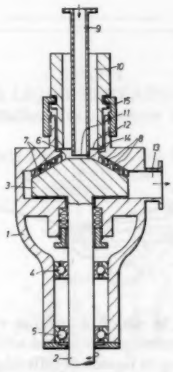
A method and apparatus for homogenizing liquids containing a plurality of non-admixable phases. The liquid is forced under pressure and at high speed from the radially outward to the radially inward periphery of an annular gap, and during the passage it is made to undergo cavitation once or repetitively.

3,744,763

## APPARATUS FOR PRODUCING EMULSIONS OR SUSPENSIONS

Hildegard Schnoring, Wuppertal-Elberfeld, and Friedrich J. Zucker, Mulheim/Ruhr, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Supraton, Bruchmann & Zucker KG, Dusseldorf, both of Germany

Filed Jan. 14, 1971, Ser. No. 106,425
Claims priority, application Germany, Jan. 30, 1970, P 20 04 143.4
Int. Cl. B01f *7/16*
U.S. Cl. 259—7 3 Claims



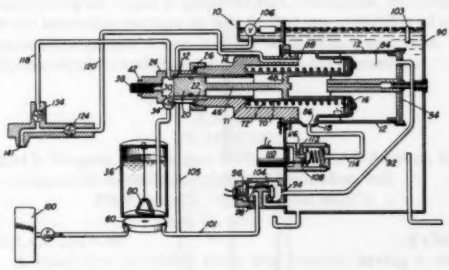
For the production of emulsions or suspensions, a centrifugal homogenising machine is used which has a rotor, an end face of which has rings formed with recesses. The rings revolve between similar rings arranged on the housing, the emulsion being introduced through at least two supply pipes arranged concentrically of one another towards the end surface of the rotor.

3,744,764

## AGITATING APPARATUS

Jason K. Sedam, Dunwoody, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 2, 1971, Ser. No. 111,959
Int. Cl. B01f *13/08*
U.S. Cl. 259—44 12 Claims



An agitating apparatus is described wherein an improved agitator system is employed in cooperation with a container so as to thoroughly mix a dispensable fluid which is positioned within the container and wherein the container has a remova-

ble top or cover portion. The agitator system includes a magnetic coupling arrangement associated therewith which is driven by a fluid motor impeller. The impeller is driven by a fluid which is customarily available at little or no cost and which is further utilized in the system or subsequently dispensed with the concentrate so as to eliminate the requirement of discarding the same. A removable stirring element is suspended from the container top or cover portion in order to prevent the same from being lost or being interferred with during the cleaning or replacement of the container.

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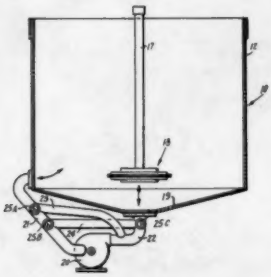
**3,744,765**
**TURBINE MIXER**
**Max L. Bard, 1604 E. 4th St., Joplin, Mo.**
**Filed Oct. 28, 1971, Ser. No. 193,275**
**Int. Cl. B01f 5/16**
**U.S. Cl. 259—96** **10 Claims**



A turbine mixer in which a turbine type impeller is immersed in a vat containing liquids and solids to be mixed. The turbine when rotating in liquids of differing viscosities tends to either produce a vortex or open space such as would starve the intake side of the turbine and prevent its operation or overfill the vortex producing excessive load factors. A pump is provided to draw material either from the side of the vat or from the bottom of the vortex and pump it to the opposite position to control the vortex so as to be filled to the desired depth.

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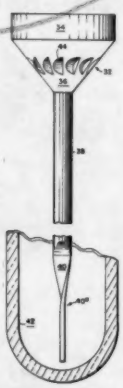
**3,744,766**
**PNEUMATICALLY OPERATED MIXING DEVICE**
**John D. Bannister, Dover, Mass., assignor to Damon Corporation, Needham Heights, Mass.**
**Filed Oct. 22, 1971, Ser. No. 191,883**
**Int. Cl. B01f 7/16, 15/00; F16c 32/00**
**U.S. Cl. 259—108** **9 Claims**



A pneumatically-driven mixing device includes a "Beams top" to rotate a relatively stiff shaft to the end of which may be affixed a mixing paddle or the like. The "Beams top" provides a simple mixer drive capable of substantial rotational velocities, but which will suffer no significant damage if the shaft is jammed or stalled.

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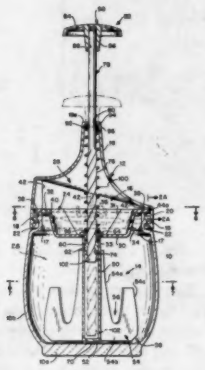
**3,744,767**
**ROTARY MIXER**
**William Blasnik, 16 Donnybrook Drive, Demarest, N.J.**
**Filed Apr. 17, 1972, Ser. No. 244,702**
**Int. Cl. B01f 7/16**
**U.S. Cl. 259—117** **18 Claims**



A manually actuatable rotary mixer having a surprisingly simple and inexpensive construction is disclosed. The device includes a rotary mixing assembly driven by a reciprocating spiral shaft received within a hollow mixer shaft from which the mixing elements radially extend. The mixer shaft is mounted fast on a bearing member having a corresponding internal spiral surface and vertically supported on a retainer plate. The retainer plate is disposed between the mixing container and a cover member through which the actuating shaft extends and means are provided on the cover member for operatively threadedly securing it to the mixing container and for pressing the retainer plate into sealing engagement with the lip of the mixing container when the cover member is tightened thereon.

A compression coil spring between the retainer plate and the cover member is effective to return the actuating shaft to its upper position after manual depression thereof, thereby to effect a rapid alternate clockwise and counterclockwise rotation of the mixing elements within the container.

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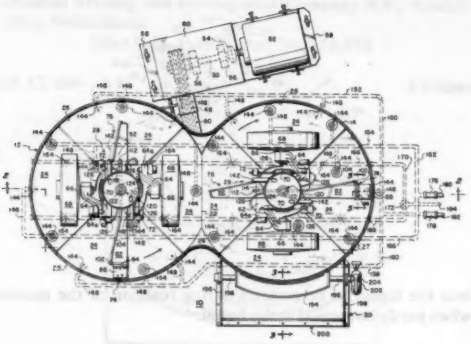
**3,744,768**
**MIXER SYSTEM**
**John H. Kauffman, Crystal Lake, and Ralph J. Donat, Chicago, both of Ill., assignors to National Engineering Co., Chicago, Ill.**
**Filed Aug. 30, 1971, Ser. No. 176,011**
**Int. Cl. B28c 7/04**
**U.S. Cl. 259—154** **10 Claims**

A mixer system for granulated material, and the like, comprising a mixing chamber having a wall surface, plow means for moving material around the chamber including an edge portion movable across and in close proximity to the surface. Fluid dispenser means is provided for delivering coolant and lubricating fluid directly onto the edge portion of the plow means for cooling the same and reducing friction between the plow means and the chamber wall surface as well as for

wetting the material. Control means is provided for controlling the time interval and/or flow rate that the dispenser



means is operative for dispensing the fluid, thereby controlling the moisturization of the material in the mixing chamber.

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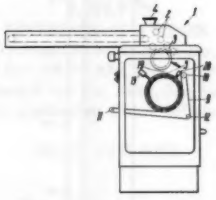
**3,744,769**
**KNEADING DEVICE**

**Kate Kemper, Wybuelstrasse 6, CH-8702, Zollikon, Switzerland**

**Filed May 3, 1972, Ser. No. 250,033**
**Claims priority, application Germany, May 10, 1971, P 21 22 969.6**
**Int. Cl. A21c 9/00**
**U.S. Cl. 259—185** **11 Claims**



A kneading device comprises dough receiving and kneading means for receiving dough pieces and carrying out a kneading operation thereon, means for feeding the dough pieces to the dough receiving and kneading means and spray means situated before the feeding means for spraying the dough receiving and kneading means prior to the feed of thereonto of the dough pieces.

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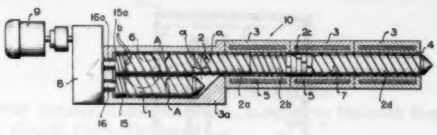
**3,744,770**
**SCREW EXTRUDER**

**Herbert Ocker, Leonberg, and Dieter Buchheit, Ditzingen, both of Germany, assignors to Werner & Pfleiderer, Stuttgart-Ferrerbach, Germany**

**Filed Aug. 25, 1971, Ser. No. 174,801**
**Claims priority, application Germany, Sept. 4, 1970, P 20 43 833.9**
**Int. Cl. B01f 7/08**
**U.S. Cl. 259—192** **5 Claims**

A screw extruder for processing melts of synthetic plastic materials or synthetic plastic material in powder or granulated form to effect mixing, kneading and homogenizing of the material and causing chemical reactions thereof comprises a long main conveyor screw and a short auxiliary screw parallel



thereto and disposed in the feed zone of the casing of the extruder. The screws are unidirectionally rotated in tight engagement with each other.

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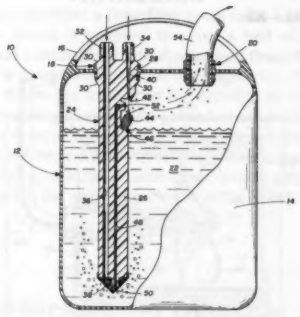
**3,744,771**
**DISPOSABLE LIQUID ENTRAINING SYSTEM**

**David W. Deaton, Dallas, Tex., assignor to Ahldea Corporation, Dallas, Tex.**

**Filed July 20, 1970, Ser. No. 56,584**
**Int. Cl. B01f 3/04**
**U.S. Cl. 261—78 A** **6 Claims**



A disposable liquid entraining system includes a liquid container and a vapor generator. Initially, the container is sterilized and is filled with a sterile liquid. Then, the vapor generator is sterilized and is mounted within the container. The vapor generator receives a sterile, pressurized gas, and operates either as a humidifier or as a nebulizer to form a vapor from the liquid in the container. During use, the interior of the container remains sterile, so that any possibility of contamination of the vapor is eliminated. After use, both the liquid container and the vapor generator are discarded.

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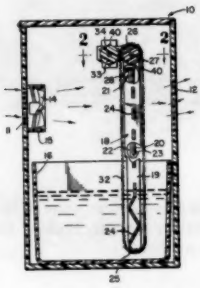
**3,744,772**
**HUMIDIFIER**

**Earl S. Wagner, and Vernon W. Dinn, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.**

**Filed Nov. 12, 1970, Ser. No. 88,571**
**Int. Cl. B01f 3/04**
**U.S. Cl. 261—80** **5 Claims**

A humidifier in which there is a housing having a water reservoir mounted therein. An endless porous belt is movably supported in the husing by a support frame with the lower portion of the belt disposed in the reservoir. The belt is rotatably driven by a drive assembly to move successive portions thereof into and out of the reservoir A blower moves air

through and out of the housing so that the air will pick up the moisture from the water saturated belt. The supporting frame



is urged toward the drive assembly to compress and knead the belt therebetween it during its rotational movement and to remove lime deposits therefrom.

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**3,744,773**

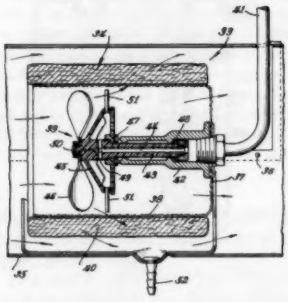
**FURNACE PLENUM OR DUCT TYPE HUMIDIFIER**

**Hugo W. Velander, Cary, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Feb. 10, 1971, Ser. No. 114,237**

**Int. Cl. B01f *3/04***

**U.S. Cl. 261—88** **3 Claims**



This disclosure comprises a humidifier mounted in a vertical position in the furnace plenum, and a modified form thereof is mounted in a horizontal position in the furnace duct, each of which has a centrifugal water impeller that throws droplets of water into a mesh or mat where it evaporates and enters into the air stream. The centrifugal water impeller units are rotated by means of a vane propeller or fan by the flow of air. This invention, therefore, eliminates the need for an electric motor or other electrical means.

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**3,744,774**

**DEVICE FOR AERATING LIQUIDS**

**Peter Hendrik Huisman, and Cornelis Adrianus Jelier, both of Pretoria, Republic of South Africa, assignors to South African Inventions Development Corporation, Pretoria, Republic of South Africa**

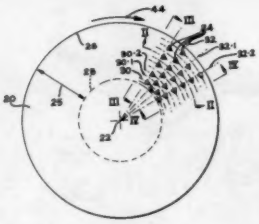
**Filed Mar. 2, 1971, Ser. No. 120,218**

**Claims priority, application South Africa, Mar. 17, 1970, 1789**

**Int. Cl. B01f *3/04***

**U.S. Cl. 261—92** **4 Claims**

The present invention provides for a device for aerating liquids such as sewage. The device includes a rotatable disc-like member having protruding formations adapted to draw air



into the liquid to be aerated during rotation of the member when partly immersed in the liquid.

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**3,744,775**

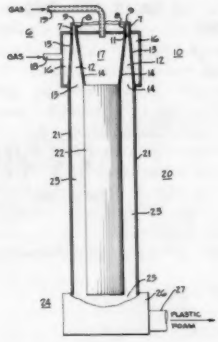
**MIXING OF MOLTEN PLASTIC AND GAS**

**Walter H. Greenberg, Syosset, N.N.Y., assignor to Bischoff Chemical Corporation, Hicksville, N.Y.**

**Division of Ser. No. 17,246, March 6, 1970, abandoned. This application Feb. 2, 1972, Ser. No. 223,022**

**Int. Cl. B01f *3/04***

**U.S. Cl. 261—122** **2 Claims**

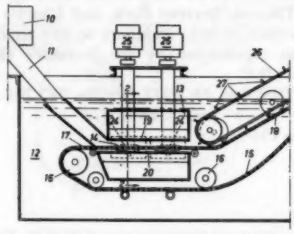


Gas is injected into a flowing stream of molten plastic to provide a mixture containing an amount of gas which at ambient conditions would constitute about 10 percent to about 98 percent of the volume of the mixture. A relatively thin, large diameter annular stream of molten plastic advances through the mixing zone, the gas being injected into the mixture through at least one of the generally cylindrical walls of the mixing zone. Of particular importance, the gas is injected through a porous wall having more than a thousand openings per square centimeter, such as an ultra-fine sintered glass filter type of gas diffusion member. Each of the walls of the mixing zone is desirably tapered, so that the thickness of the molten cellular plastic effluent is greater than the thickness of the entering stream. The mixture advances through a length of mixing zone which is from about 10 to about 100 times the marginal increase in thickness of the stream. The effluent from the mixing zone flows through a heated stabilization zone which is several times longer than the mixing zone. The stabilized mixture can then be reshaped for flowing into streams utilizing the mixture of molten plastic and gas.

## 3,744,776
## DEVICE AT COOLING BATHS FOR TEMPERING FURNACES

**Bengt Johan Nyberg, Goteborg, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands**

**Filed Sept. 1, 1971, Ser. No. 176,978**
**Int. Cl. C21d 1/64**
**U.S. Cl. 266—6 R** **3 Claims**

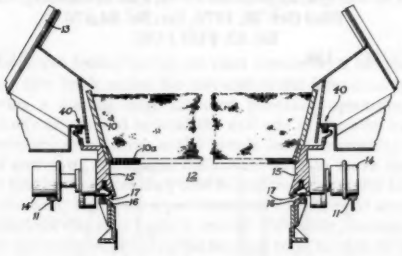


In a cooling bath arranged in connection to a tempering furnace, a shielded chamber being immersed in the bath, a smooth first conveyor running horizontally through said chamber, perforations in said conveyor being adjustable to coincide with corresponding perforations in the bottom of the chamber, reversible means for giving a cooling fluid contained in the bath an ever changing flow direction within said chamber, a second sloping conveyor provided with carrier means and adapted to bring the cooled work pieces up from the bath after passing the shielded chamber. By constantly changing the flow direction of the cooling fluid and by governing the rate of flow through the chamber by means of the adjustably arranged communications between the perforations in conveyor and chamber bottom it is possible to obtain a very uniform cooling.

## 3,744,777
## SINTERING MACHINES

**Francis Marsh, 70 Atwood Road, Manchester, England**

**Continuation of Ser. No. 70,074, Sept. 8, 1970, abandoned.**
**This application Apr. 26, 1972, Ser. No. 247,894**
**Claims priority, application Great Britain, Oct. 20, 1969, 51,359/69**
**Int. Cl. F27b 9/00**
**U.S. Cl. 266—21** **13 Claims**

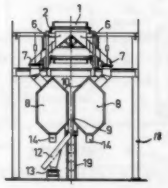


Apparatus for the gaseous treatment of solid materials of the kind wherein a plurality of pallets each having a base in the form of a grate are adapted to be moved in end-to-end abutting relationship through treatment zone where a gaseous medium is passed through material on the pallets, and provided with sealing means to ensure a seal between the sides of the pallets and the sides of means for the supply of treatment gas in the treatment zone, characterised in that said sealing means comprise opposed slidably engaging sealing strips carried by the sides of the pallets and the sides of the means for supply of treatment gas respectively, there being longitudinally extending leaf springs sealably connecting the strips carried by one of these parts with the part and urging same into sealing engagement with the opposed strips.

## 3,744,778
## SINTERING MACHINE

**Willi Buhner, Essen, Germany, assignor to Heinrich Koppers GmbH, Essen, Germany**

**Filed July 12, 1971, Ser. No. 161,792**
**Claims priority, application Germany, July 18, 1970, P 20 35 782.8**
**Int. Cl. F27b 9/00**
**U.S. Cl. 266—21** **7 Claims**

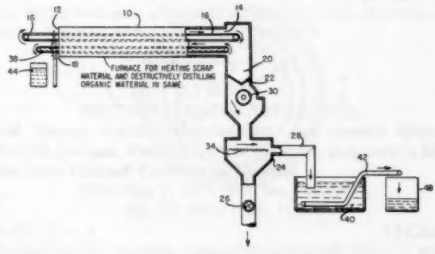


In a sintering machine a travelling grate has a lower run and an upper run which is adapted to carry a bed of sinter mix which is in part combustible and discharged from the grate in the region of a downstream end of the upper run. Wind boxes are arranged below the lower run for drawing air through the bed and withdrawing combustion gases from the same. One or two conduits are arranged beneath the lower run communicating with the wind boxes. The conduits are so arranged as to intercept residual quantities of sinter mix which adhere to the grate and drop off the same as it moves in the lower run.

## 3,744,779
## SCRAP RECOVERY APPARATUS

**John E. Perry, Bay Village, Ohio, assignor to Horizons Research Incorporated, Cleveland, Ohio**

**Division of Ser. No. 874,891, Nov. 7, 1969, Pat. No. 3,697,257.**
**This application May 31, 1972, Ser. No. 258,466**
**Int. Cl. C22b 7/00**
**U.S. Cl. 266—33 S** **1 Claim**




The recovery of metal values in scrap materials by destructive distillation removal of organic non-metal materials, at temperatures which leave the metal relatively unaffected.

## 3,744,780
## METHOD OF TREATING MOLTEN MATERIAL BY USE OF A LANCE

Eugene A. Pelczarski; Paul J. Larosa, both of Allison Pk., and James A. Karnavas, Pittsburgh, all of Pa., assignors to Applied Technology Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1972, Ser. No. 216,191
Int. Cl. C21b 3/02
U.S. Cl. 266—34 L 22 Claims

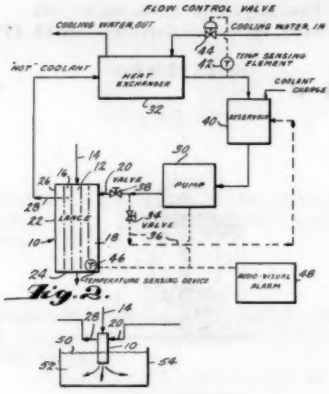


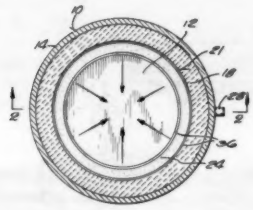

Fig. 2.

The disclosure relates to a method of treating a molten bath of material such as iron by using a lance for supplying a treating material usually in a fluid state to the bath where the lance is cooled with a non-aqueous coolant which has a boiling point substantially higher than that of water or which undergoes dissociation at a temperature that is substantially higher than the boiling point of water for substantially the same pressure conditions.

## 3,744,781
## METHOD AND APPARATUS FOR GAS STIRRING OF MOLTEN METAL

Karl F. Gabler, Brillion, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed June 24, 1971, Ser. No. 156,435
Int. Cl. C21c 7/00
U.S. Cl. 266—34 PP 11 Claims

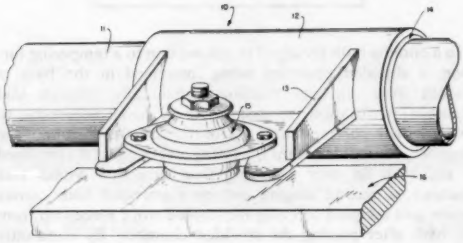


A ring-shaped member of porous refractory material is mounted in the refractory lining of a vessel for molten metal and extends around the inner periphery of the vessel. The member has at least a part of its surface area exposed to the molten metal in the vessel. Gas introduced through the ring-shaped member will pass upwardly through the molten bath in the area adjacent the vessel side eall, causing upward movement of the molten metal bath in such area. The upwardly flowing metal moves radially inwardly towards the center at the surface area and then moves downwardly in the central portion of the vessel.

## 3,744,782
## TORSIONAL SHEAR DAMPED FOUNDATION MEMBER

Edward V. Thomas, Severna Park, and Charles S. Longley, Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1972, Ser. No. 247,295
Int. Cl. F16f 1/16
U.S. Cl. 267—154 1 Claim

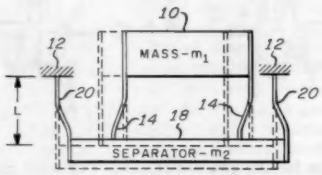


The invention is a torsional shear damped foundation member to support a resilient mount on a non-directional loading device which causes a visco-elastic cylinder to support a load in static shear and to provide a high dynamic loss factor in dynamic shear.

## 3,744,783
## FRICTIONLESS SPRING SUSPENSION SYSTEM

Edwin H. Mernyk, 22 Stephens Drive, East Brunswick, N.J.

Filed Oct. 28, 1970, Ser. No. 84,670
Int. Cl. F16f 15/02
U.S. Cl. 267—136 8 Claims



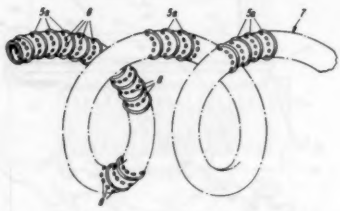

A frictionless spring suspension system particularly suited for accelerometric devices in which an indicating displacement is restrained to be in a direction parallel to a measuring axis, and independent of forces operating in a direction transverse to that axis.

**3,744,784**

## MANDREL FOR MAKING SAUSAGE CASINGS AND WIRE STRUCTURE THEREFOR

**Hubert J. Vaessen, Deventer, Netherlands, assignor to H. Vaessen N.V., Deventer, Netherlands**

**Division of Ser. No. 658,749, Aug. 7, 1967, Pat. No. 3,526,928.**
**This application June 25, 1970, Ser. No. 49,632**
**Int. Cl. A22c *11/00***
**U.S. Cl. 269—47** **2 Claims**



A mandrel for making sausage casings provided with a non-smooth outer surface containing circumferential or longitudinal ribs thereon.

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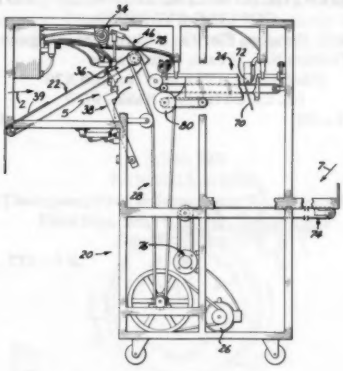
**3,744,785**

## SHOP TOWEL FOLDER

**Charles R. Grantham, 1154 E. 12th St., Los Angeles, Calif.**

**Filed June 7, 1971, Ser. No. 150,553**
**Int. Cl. B42c *1/00***
**U.S. Cl. 270—45** **8 Claims**



A shop towel folder having an inlet conveyor, a normally stationary first knife under the exit end of the inlet conveyor and having a leading edge directed generally upwardly, a second knife above and beyond the exit end of the inlet conveyor, working rearwardly; as the towels lead downwardly off the inlet conveyor, it engages the towels so as to move them over the first knife where they fold in half thereover, and form a stack thereon, and after a predetermined number of towels are so stacked, the first knife is moved forwardly, forming a crease in the stack and forcing the leading edge formed by the crease into a second conveyor, whereby the stack is carried as a unit and a bundle to a depository.

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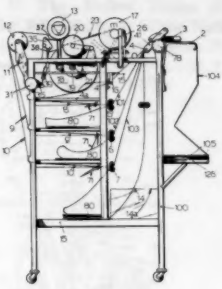
**3,744,786**

## DELEAVING AND TRIMMING MACHINE

**Lawrence B. Patterson, R.D. No. 3, Cochranton, Pa.**

**Filed Sept. 4, 1970, Ser. No. 69,595**
**Int. Cl. B65h *41/00*, *17/02***
**U.S. Cl. 270—52.5** **15 Claims**

A machine for trimming, removing carbon paper from, separating, and refolding plies of forms, such as Data Processing forms. The machine trims the edges, separates the plies of paper from the carbon, and folds the paper and rolls the carbon paper. The machine will fold one or more forms



separately. Previous machines relied upon forms folding themselves along the lines they were previously folded. The folding device enables the machine to be speeded up and the output of the machine is greatly increased.

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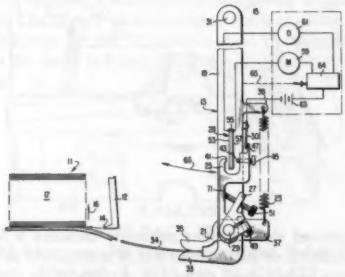
**3,744,787**

## GRIPPER JAW INSERT MISTAKE DETECTOR

**Wilbur J. Morrison, Nazareth, Pa., assignor to Bell and Howell Company, Chicago, Ill.**

**Filed Aug. 11, 1970, Ser. No. 62,912**
**Int. Cl. B65h *43/02***
**U.S. Cl. 270—56** **9 Claims**



A device is disclosed for detecting "double-or-miss" mistakes of an inserting machine. The device is made up of the inserting machine's gripper jaws, an indicator element, a linking element connecting the gripper jaws with the indicator element, and an electronic detector. The indicator element's position is determined by the extent to which the jaws are open; and a two pole electrode in the electronic detector detects the position of the indicator element.

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**3,744,788**

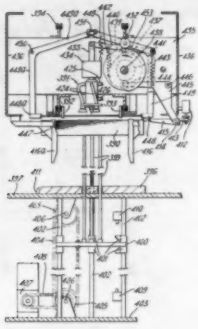
## RECORD FEEDING APPARATUS

**David George Parker, Warlingham, and Donald Richard Patrick Jackson, London, both of England, assignors to Masson Scott Thrissell Engineering Limited**

**Filed May 5, 1971, Ser. No. 140,509**
**Int. Cl. B65h *1/00*, *5/00***
**U.S. Cl. 271—1** **13 Claims**

Apparatus for feeding records successively from a stack comprises a finger for displacing the uppermost record out of alignment with the stack and into vertical alignment with a suction device positioned above the record. The suction device is lowered and a projection slidably carried in the suction device locates in the central hole of the record and rests on the next lower record in the stack. The suction device is

also brought into engagement with the uppermost record, suction is applied and the suction device is raised, the projection remaining and being held in contact with the next lower



record to assist in separation of the uppermost record from the next lower record, the projection then being raised with the suction device.

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**3,744,789**

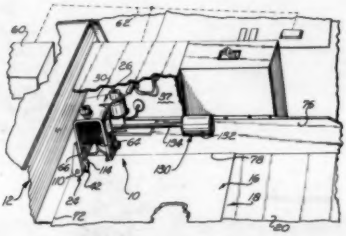
**SHEET FEEDER ASSEMBLY**

**James A. Kolibas, Broadview Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio**

**Filed May 13, 1971, Ser. No. 143,025**

**Int. Cl. B65h** *3/06*

**U.S. Cl. 271—42** **4 Claims**



An improved sheet feeder assembly includes a feed foot having a friction or feed wheel which is disposed in pressure engagement with a sheet to be fed. An electrical vibrator assembly moves the feed foot through forward and return strokes. During a return stroke, the friction wheel rolls along an upper surface of a sheet. During a forward or feed stroke, a one-way clutch assembly holds the friction wheel against rotation so that the sheet is moved forwardly with the friction wheel. As the friction wheel moves forwardly, it also moves toward a guide or register surface to square-up or side register a skewed sheet as it is fed forwardly. The vibrator assembly and feed foot are mounted on a four bar linkage arrangement so that the orientation of the feed foot relative to a pile of sheets is maintained constant as sheets are fed from the pile. The pressure with which the friction wheel engages a sheet is controlled by a counter-weight which is adjustable to vary the pressure between the friction wheel and a sheet.

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**3,744,790**

**SORTER FOR USE IN CONJUNCTION WITH PHOTOCOPY MACHINES**

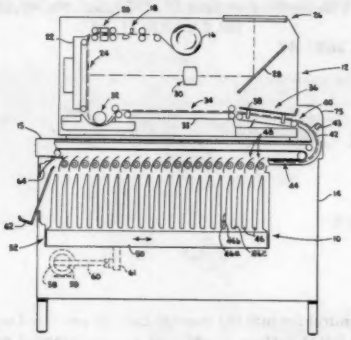
**Lionel B. Hoffman, Wcykoff, N.J., assignor to Pitney Bowes-Sage, Inc., North Hawthorne, N.J.**

**Filed Sept. 24, 1971, Ser. No. 183,560**

**Int. Cl. B65h** *29/60*

**U.S. Cl. 271—64** **26 Claims**

A sorter is functionally mated to a photocopier operating in a multicopy mode to sort successive copy sheets exiting the copier and translated on a vacuum conveyor into discrete collations accommodated in vertical bins located there below. Deflector assemblies are sequentially actuated under the control of a switch actuated by each copy sheet to route succes-



sive copy sheets into successive bins and are automatically reset at the conclusion of each multicopy run. Hold back members control the sheets stacked on edge in each bin to maintain true collations.

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**3,744,791**

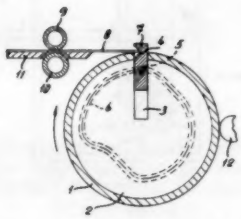
**APPARATUS FOR HANDLING SHEETS ON A ROTARY COPYING CYLINDER**

**Andreas M. G. Bongers, Blerick, Netherlands, assignor to Ocevan der Grinten N.V., Venlo, Netherlands**

**Filed July 8, 1971, Ser. No. 160,620**

**Int. Cl. B41f** *1/30;* **B65h** *29/20*

**U.S. Cl. 271—80** **8 Claims**



A rotary cylinder for handling sheets in copying operations is provided with a clamping bar which is reciprocable in and out relative to a slot in the circumferential wall of the cylinder and as the cylinder is rotated is moved successively (1) outward to receive the leading edge of a sheet, (2) inward to clamp the sheet edge against an edge of the slot, (3) then further inward after the copying work on the sheet, so as to release the sheet edge, and (4) finally outward again to eject the sheet edge by pushing it out of the slot if it fails to spring out of its own accord. Simple control means enable steps (3) and (4) to be performed in any desired relationship to one or more rotations of the cylinder.

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**ERRATUM**

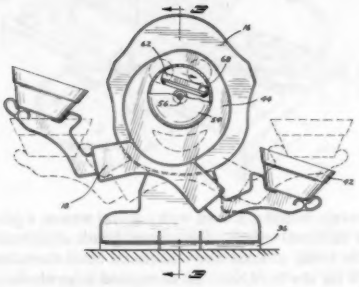
For Class 272—73 see:
Patent No. 3,744,794

3,744,792

## SOUND MECHANISM FOR A BALANCE DEVICE

Joseph M. McClary, Nashville, Tenn.; Jack Lewis Lemkin, and Asa Lynn Donaldson, both of Cincinnati, Ohio, assignors to General Mills Fun Group Inc., Minneapolis, Minn.

Filed May 6, 1971, Ser. No. 140,933
Int. Cl. A63f 9/00
U.S. Cl. 273—1 R 4 Claims



A concave trough having a central notch is mounted to the pivoted shaft of a balance arm. A ball is located in the trough. A metal bell is mounted to the pivot supporting the pivoted shaft. The bell surrounds the trough with the inner surface of the bell being spaced less than a ball diameter from each end of the trough. Tilting of the balance arm causes the ball to become dislodged from the notch and strike the bell.

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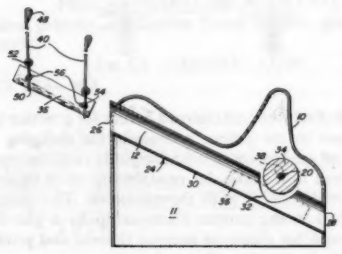
3,744,793

## SAWMILL GAME

Purl E. Thompson, 1046 Independence St., Waterloo, Iowa

Filed Sept. 28, 1971, Ser. No. 184,532
Int. Cl. A63f 9/00
U.S. Cl. 273—1 R 8 Claims



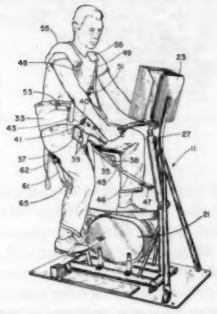
A sawmill game has a housing defining an inclined passageway, and at least one discrete article of finite length dimensioned to pass through the passageway. A simulated saw wheel is mounted on a shaft extending through the housing. A disc is mounted on the shaft and arranged to extend into the passageway to engage and be rotated by a passing article. At least two manipulating devices each having a longitudinally extending member with two spaced apart ends, a hook formed at one end and a loop pivotally mounted at the other end, are used to manipulate the article and place the article in the passageway.

3,744,794

## RESTRAINT SYSTEM FOR ERGOMETER

Raymond L. Gause, and Raymond A. Spier, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 25, 1971, Ser. No. 156,725
Int. Cl. A63b 23/04
U.S. Cl. 272—73 3 Claims



A restraint system for securing a person to an ergometer while exercising under zero gravity conditions or while operating the ergometer in earth environment in a position other than the upright position. A padded, form-fitting body belt fits around the operator's waist and suspenders are attached to the body belt. The body belt is secured to the ergometer forwardly and rearwardly of the ergometer seat by adjustable belts joined to the body belt and releasably hooked to the ergometer frame.

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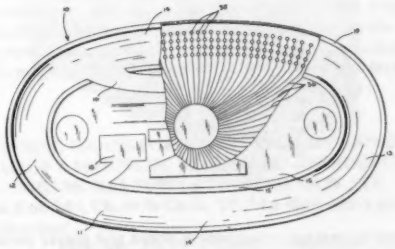
3,744,795

## TOY RACE TRACK

Marion M. Lipscomb, 3613 Brentwood Road, Raleigh, N.C.

Filed Feb. 7, 1972, Ser. No. 224,177
Int. Cl. A63f 9/14; A63h 18/16
U.S. Cl. 273—86 B 6 Claims



In abstract, a preferred embodiment of this invention is a race track for toy vehicles wherein a plurality of magnets mounted beneath the surface of the race track move rapidly thereunder to pull the racing cars along. Since there is no predetermined track for each vehicle, skids, spin-outs and wrecks can occur as in real auto racing as well as cars passing each other as they race.

**3,744,796**

## HOLDER FOR MOBILE TARGET

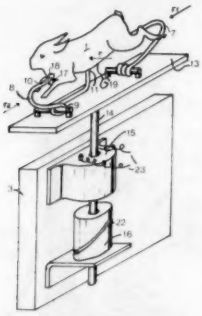
**Norbert Emmanuel Renault, Rue des Princes, Combourg, France**

**Filed Mar. 23, 1972, Ser. No. 237,282**

**Claims priority, application France, Mar. 30, 1971, 7112006**

**Int. Cl. F41j 9/02**

**U.S. Cl. 273—105.2** **7 Claims**



A mobile practice target comprises a pattern of tracks which enables a carriage to be moved at different speeds and in opposite directions, in a random manner. A target is mounted in the carriage to simulate the movement of a wild animal, such as a rabbit. When a gunshot strikes the target, it is released to simulate the striking of the animal.

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**3,744,797**

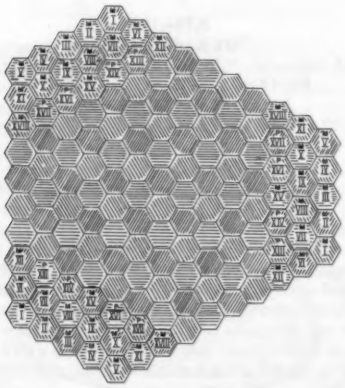
## CHESS GAME APPARATUS

**Mark Alan Hopkins, Box 88, Wallpack Center, N.J.**

**Filed Nov. 10, 1971, Ser. No. 197,262**

**Int. Cl. A63f 3/02**

**U.S. Cl. 273—131 AB** **1 Claim**



Game apparatus comprising a board and player pieces are provided whereby each of three players may simultaneously compete against the other two.

The board is in the shape of a six-sided polygon of which three relatively long sides alternate with three relatively short sides. The face of the board is divided into 141 hexagons of three colors, there being 47 hexagons of each color, no two adjacent hexagons being of the same color. Used with the board are three sets of 18 player pieces, each set including 4 pawns and 14 major pieces.

**3,744,798**

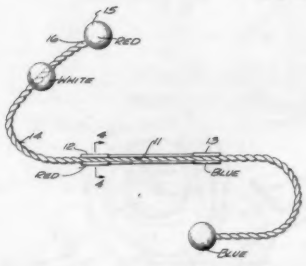
## SPLIT TUBE CORD AND BEAD PUZZLE

**Henry S. Schmid, 7800 W. Vienna Avenue, Milwaukee, Wis.**

**Filed Feb. 7, 1972, Ser. No. 224,126**

**Int. Cl. A63f 9/08**

**U.S. Cl. 273—159** **4 Claims**




The puzzle includes a cord with a spiral weave, a plurality of beads of different colors, one of said beads attached to each end of the cord, at least one additional bead threaded with a sliding fit on the cord, and an elongated tube element with a longitudinal split narrower than the cord diameter. The puzzle resides in the difficulty encountered in placing the cord within the split tube or removing it therefrom.

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**3,744,799**

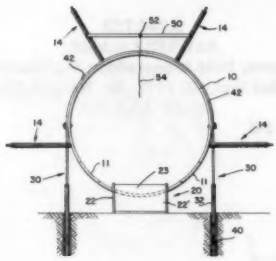
## GOLF PRACTICE DEVICE

**Cooper Hightower, Teal St. Box 628, Moncks Corner, S.C.**

**Filed Mar. 3, 1972, Ser. No. 231,518**

**Int. Cl. A63b 69/36**

**U.S. Cl. 273—183 R** **15 Claims**



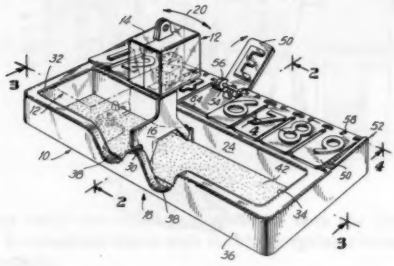
A device is disclosed and claimed herein for practice and instructional use in the proper technique for swinging a golf club. A pair of spaced apart, circular guide rails are provided and maintained in a particular relationship so as to define a complete circular swing path therebetween. The guide rails are maintained in the proper relationship by a plurality of spacer or connector elements secured thereto and positioned around the circle. Further, the guide rails are supported by a plurality of elements from the ground or other surface. A first support element may be provided that defines a starting point for the golf swing where a ball rests and may be properly addressed. Further, a shield may be provided on the first support element as a safety factor and also for display of instructional indicia. Further support is provided by a pair of adjustable rods that are received on the ground or other surface, the length of which may be varied so as to adjust the plane of the swing arc. Further embodiments of the present invention include a head movement indicator cord, variable size guide rails, and shock absorbing coverings around the upper portion of the swing arc.

3,744,800

## GAME COMBINING CHANCE AND JUDGMENT

Laurie J. Campbell; Raymond J. Lohr, and Charles M. Kienholz, all of Erie, Pa., assignors to Louis Marx & Co., Inc., New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,818
Int. Cl. A63f 3/00
U.S. Cl. 273—135 E 11 Claims



A game which combines elements of chance and exercise of judgment. A hollow transparent container which houses a chance-indicating structure is movable from a starting position to an end position where the chance-indicating structure will indicate, by chance, one of a plurality of different possible scores. A score-storing structure has a plurality of movable elements carrying score-indicating indicia and capable of being moved from rest positions to locations displaced from the latter rest positions, respectively. Thus, the operator after moving the container to its end positions so as to receive a score from the chance-indicating structure, can select from among the elements which carry the score-indicating indicia certain ones of these elements to be displaced from their rest positions to the locations displaced from the latter positions, so that by selection of the latter elements the element of judgment is introduced into the game. Those score-indicating elements which remain in their rest positions when it is no longer possible to select at the score-indicating elements a score matching that provided by the chance-indicating structure will indicate the final score of a given player.

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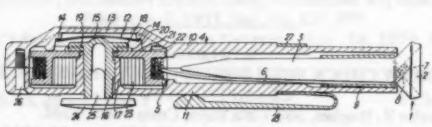
3,744,801

## GOLFING EQUIPMENT

Kenneth Patrick Morritt, Falmouth, Cornwall, England, assignor to K. P. Morritt Limited, Cornwall, England

Filed June 9, 1972, Ser. No. 261,511
Claims priority, application Great Britain, June 28, 1971, 30,258/71
Int. Cl. A63b 69/36, 57/00
U.S. Cl. 273—208 8 Claims



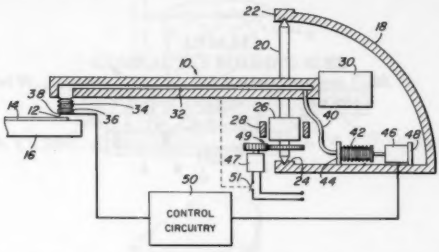
An article of golfing equipment has a golf tee attached to a spring-biassed reel by a length of string. The reel is mounted in a casing which receives the tee when the spring rotates the reel to wind the spring onto it. The reel is normally locked by a one-way ratchet but is released to wind in the string by a push-button which has a spike and is detachable from the casing so as to be usable as a ball marker. When practising, the cord can be aligned with the green or hole and used as an aid in swinging the club face in the correct direction. The casing has a spring-clip so that the article can be clipped into the golfer's pocker when he is not using it.

3,744,802

## TONE ARM FOR RECORD TURN TABLE

William R. Bowerman, 1824 Mississippi Street, Lawrence, Kans.

Filed Dec. 21, 1970, Ser. No. 100,036
Int. Cl. G11b 3/10
U.S. Cl. 274—1 R 6 Claims




A tone arm for a record turntable is movable in the horizontal plane only, the needle tip being independently movable into and out of engagement with the record surface. A fluidic system controls the pressure of the needle against the record through an extensible bellows supporting the needle. An air jet control system is also provided for moving the tone arm with respect to the record surface. In one instance, the tone arm moves by a jetting action along a radial path, the arm being hinged to open or closed air ports on a carriage mounted for movement along a transverse support. In another embodiment, a pivoted tone arm is provided with jet ports at its outer end for selective pivoting action of the arm.

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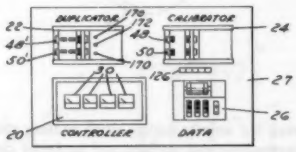
3,744,803

## METHOD OF AND APPARATUS FOR TAPE CARTRIDGE DUPLICATION

Lattif Allan Bazzy, Sterling Heights, Mich., assignor to Make-A-Tape, Inc., Fraser, Mich.

Filed Dec. 7, 1971, Ser. No. 205,625
Int. Cl. G11b 15/24, 15/29
U.S. Cl. 274—3 14 Claims




A method of and apparatus for measuring the length of magnetic tape contained in tape cartridges, cueing the magnetic tape in reference to the tape splice, and rapidly duplicating the magnetic signals from one cartridge on to another.

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3,744,804

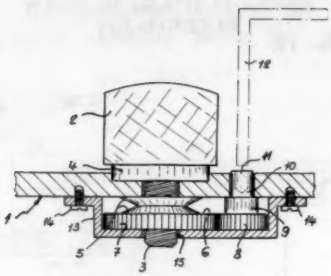
## RETAINING MEANS FOR ADJUSTABLY SECURING THE HEAD OF A MAGNETIC RECORDING-REPRODUCING MEANS TO A SUPPORTING COVER PLATE

Stefan Kudelski, Ch. de la Croix, 1052 Le Mont-sur-Lausanne, Switzerland

Filed Apr. 19, 1972, Ser. No. 245,309
Claims priority, application Switzerland, Apr. 22, 1971, 5855/71
Int. Cl. G11b 5/54
U.S. Cl. 274—4 R 6 Claims

A supporting means for mechanically securing a recording-reproducing head to one side of a cover plate while providing a release means for the head, accessible from the same side of the plate. The recording-reproducing head is integrally

formed with a threaded rod extending below the cover plate and resiliently secured by a locking nut having a geared periphery. An adjusting pinion is coupled to the locking nut and has a cylindrical portion extending through the cover plate where it may be turned by a wrench.



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**3,744,805**

**SLIDE RING FOR AXIALLY ACTING SHAFT SEALING RINGS**

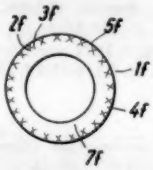
**Richard Heinrich, Heilbronn, Germany, assignor to Kupfer-Asbest-Co Gustav Bach, Heilbronn, Germany**

**Continuation of Ser. No. 630,387, Jan. 4, 1969, abandoned. This application Aug. 2, 1971, Ser. No. 168,502**

**Claims priority, application Germany, June 6, 1968, P 17 50 832.6; Aug. 30, 1968, P 17 75 596.3**

**Int. Cl. F16j** *15/34*

**U.S. Cl. 277—96** **11 Claims**



A slide ring for axially acting shaft sealing rings which has an outer circumferential surface and an inner circumferential surface and furthermore is provided with a side face extending from the inner circumferential surface to the outer circumferential surface while forming a sliding surface for the ring, the sliding surface being provided with grooves distributed over an annular area on the sliding ring and extending at least toward one of said circumferential surfaces.

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**3,744,806**

**PIPE JOINT SEAL**

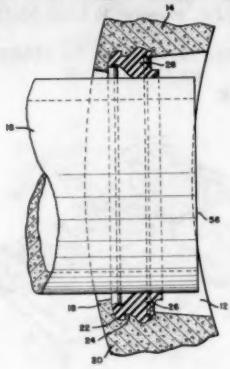
**Lewis R. Keyser, Dayton, Ohio, assignor to Price Brothers Company, Dayton, Ohio**

**Filed Nov. 22, 1971, Ser. No. 200,936**

**Int. Cl. F16j** *15/10*

**U.S. Cl. 277—152** **7 Claims**

A joint between a manhole riser and a pipe feeding into the manhole includes a resilient gasket embedded in the riser and projecting radially into the opening through the wall of the riser to provide a seal against the outer surface of the intersecting pipe. Wire hoops are received in continuous grooves in the gasket to both stretch it outwardly and resist rolling of the gasket as the intersecting pipe is installed. Additionally, the opening through the riser wall includes an annular, inwardly projecting shoulder designed to support the intersecting pipe should the pipe shift with the respect to the riser, to thereby avoid the loss of seal that would result if the gasket itself supported the entire shear load.



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**3,744,807**

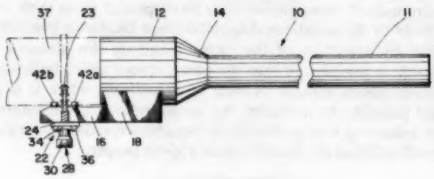
**ADAPTER FOR PIPE MACHINE POWER**

**Archie R. Spires, 983 Lancaster Avenue, and William H. Routt, 6862 Ardelle Drive, both of Reynoldsburg, Ohio**

**Filed June 1, 1971, Ser. No. 148,311**

**Int. Cl. B23b** *31/00;* **B25b** *1/20*

**U.S. Cl. 279—1 A** **6 Claims**



An adapter for increasing the pipe diameter capacity of a pipe machine power drive. The adapter has a cylindrical shaft secured in the power drive chuck and a channel member welded to and extending longitudinally from the shaft in a position parallel to and radially offset from the axis of the shaft. Serrated jaw inserts are provided in the channel to grip a pipe segment and center it coaxially with the axis of rotation. A chain gripping means clamps the pipe segment against the serrated jaw inserts.

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**3,744,808**

**DRAW CHUCK WITH INDIVIDUALLY ADJUSTABLE CLAMPING JAWS**

**Charles R. Hughes, 308 Vista Baya, Costa Mesa, Calif.**

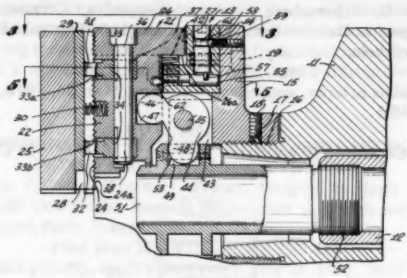
**Continuation-in-part of Ser. No. 852,651, Aug. 25, 1969, abandoned. This application Feb. 14, 1972, Ser. No. 225,958**

**Int. Cl. B23b** *31/16*

**U.S. Cl. 279—1 SJ** **34 Claims**

A chuck having bell crank driven cylindrical master jaws paired with associated workpiece clamping jaws. Each clamping jaw is securely and safely locked to its master jaw and released therefrom by a clamping plate which is disposed in a radial, T-shaped slot in the clamping jaw. The plate has legs extending rearwardly into a radial passage in the master jaw engaging therein a radially disposed camming pin which is actuable to draw the clamping jaw into locked or released position with the master jaw. The clamping jaw, in its released

position, is movable radially with respect to the master jaw, for adjustment or removal by sliding movement on the clamping plate. A locking pin is provided to lock each master jaw



against radial movement to machine or bore the clamping jaws. A cylindrical sleeve seals the chuck against contaminating particles.

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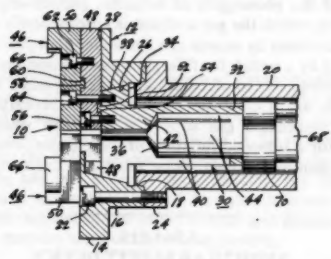
**3,744,809**
**HEAVY DUTY COLLET OPERATED CHUCK**
**Herbert E. Bennett, Route 4, Beloit, Wis.**
**Filed Sept. 7, 1971, Ser. No. 178,350**
**Int. Cl. B23b** *31/10, 31/20*
**U.S. Cl. 279—121** **5 Claims**



The disclosure relates to an improved heavy duty lathe chuck provided with radially disposed jaws that are positively connected to an actuating collet and slidably supported in mating radial slots in the body of the chuck.

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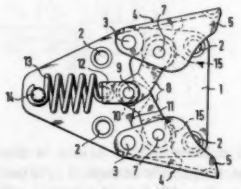
**3,744,810**
**TOE IRON FOR SAFETY SKI BINDINGS**
**Roland Jungkind, Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany**
**Filed Apr. 7, 1971, Ser. No. 131,977**
**Claims priority, application Germany, Apr. 14, 1970, P 20 17 849.9**
**Int. Cl. A63c** *9/00*
**U.S. Cl. 280—11.35 T** **7 Claims**



Two levers are pivoted to a toe iron part that is fixed to the ski and at their free ends carry respective sole-holders and are biased by a spring element toward their normal position. Each lever forms a crank of a slider crank mechanism. These two slider crank mechanisms have a common slider, which is guided in an at least approximately T-shaped cam slot that is fixed to the ski and has a stem which extends in the longitudinal direction of the ski. The spring element extends in the longitudinal direction of the ski and acts on the slider of the slider crank mechanisms.

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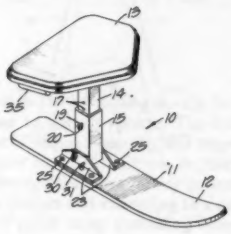
**3,744,811**
**COMPACTLY FOLDING SLED**
**Earl W. Johnston, 555 Clement Drive, Glendale, Calif.**
**Filed June 8, 1971, Ser. No. 150,981**
**Int. Cl. B62b** *13/16*
**U.S. Cl. 280—12 K** **6 Claims**



A compactly folding sled having a single, broad runner provided with a seat for one rider and selectively lockable in an upright extended position or compactly folded against the runner when not in use.

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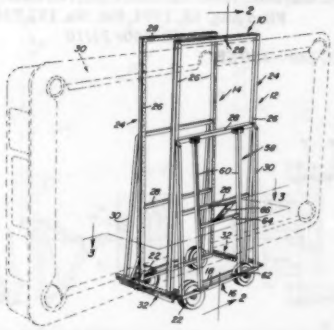
**3,744,812**
**POOL TABLE DOLLIE**
**Howard G. Langhausen, 2104 22nd Street West, Billings, Mont.**
**Filed June 11, 1971, Ser. No. 152,160**
**Int. Cl. B62b** *3/02*
**U.S. Cl. 280—35** **10 Claims**



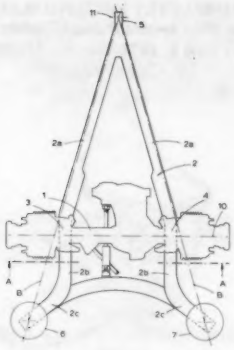
A two-section dollie for the support and transporting of a vertically orientated pool table. The sections are releasably and adjustably interconnected by a pair of cradel arms mounted on one section and selectively engaged with the second section. The one section includes angularly extendable dual support legs, while the second section mounts dual rocker arms utilized to horizontally swing the supported table. The table supporting assembled sections provide a four-wheel base.

3,744,813

## MOTOR VEHICLE SUSPENSION

James Edward Magleave, Ashton-in-Makerfield, and Harold Rushton, New Longton, both of England, assignors to British Leyland Truck and Bus Division Limited, Leyland, England

Filed July 2, 1971, Ser. No. 159,436
Int. Cl. B60g 9/02
U.S. Cl. 280—124 R 6 Claims



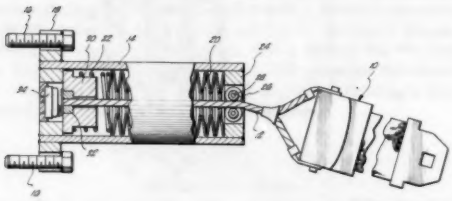
A rigid rear axle for a vehicle is located relative to the vehicle by a trailing V-frame pivotedly attached at the apex of the V to the vehicle body. The arms of the V-frame are cranked at their ends and suspension elements, such as air springs, are disposed between the vehicle and the cranked ends. The axle is secured to the V-frame at a point intermediate the apex and the cranked ends.

3,744,814

## SHOCK ABSORBING SEATBELT ACTUATOR

Oded E. Sturman, 18643 Kirkolm Lane, Northridge, Calif.

Filed Aug. 18, 1971, Ser. No. 172,721
Int. Cl. B60r 21/10
U.S. Cl. 280—150 SB 4 Claims



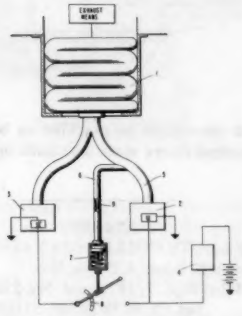
The invention relates to a shock absorbing device for use in a safety belt system which substantially decreases the forces applied to a human body restrained by the safety belt in high impact situations. The invention comprises a plurality of Belleville springs which are used to absorb and dissipate the energy produced by a vehicle collision. The novel configuration disclosed increases the comfort of the confined individual and protects him from those injuries which have been encountered with the use of conventional safety belts.

3,744,815

## INFLATABLE GAS CUSHION FOR THE PROTECTION OF VEHICLE PASSENGERS, ESPECIALLY MOTOR VEHICLES

Hans O. Scherenberg, Stuttgart-Heumaden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturckheim, Germany

Filed Mar. 23, 1971, Ser. No. 127,209
Claims priority, application Germany, Mar. 24, 1970, P 20 14 048.1
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 11 Claims



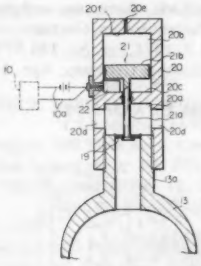
An automatically inflatable gas cushion system for the protection of the passengers of vehicles, particularly of motor vehicles, in which the gas cushion is automatically inflated in case of accidents by means of a gas under high pressure which is released by a switch for filling the gas cushion upon exceeding a predetermined deceleration; the pressure in the gas cushion is again exhausted immediately thereafter while a second compressed gas supply is provided which can be released for a renewed inflation of the gas cushion only after the gas cushion has been once filled and exhausted beforehand.

3,744,816

## VEHICULAR SAFETY DEVICE

Michio Yamaguchi, Kanazawa-ku, Yokohama; Yasuchiro Saito, Meguro-ku, Tokyo; Tsugio Noda, Kawagoe; Shinzo Tsuji, Kawagoe, and Takashi Mitani, Kawagoe, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Apr. 23, 1971, Ser. No. 136,858
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 1 Claim



An improved vehicle safety device is disclosed which is adapted to protect a vehicle occupant or a pedestrian from injury in the event of a collision of a motor vehicle. The safety device includes an inflatable confinement or a protector bag which is arranged to be rapidly expanded to a protective position immediately when the motor vehicle encounters the colli-

sion. The inflatable confinement is expanded with a pressurized gas which is supplied from a pressurized gas generator which is normally closed by a rupturable sealing member. The sealing member is ruptured to open the gas generator by means of a mechanism including an explosive means and a rupturing means which is moved by activation of the explosive means to a position in which the sealing member is ruptured.

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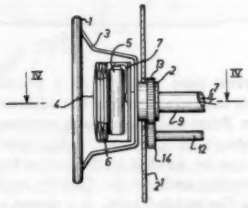
**3,744,817**

## COMBINATION STEERING-WHEEL AND SAFETY DEVICE FOR AUTOMOTIVE VEHICLE

**Jacques Ousset, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France**

**Filed June 28, 1971, Ser. No. 157,461**
**Claims priority, application France, July 28, 1970, 7027761**
**Int. Cl. B60r *21/08***
**U.S. Cl. 280—150 AB** **3 Claims**



Device comprising the combination of a steering wheel with a safety device of the type comprising a flexible inflatable bladder and a steering mechanism in which the axis of the steering column and the axis of rotation of the steering wheel are separate, the safety device is disposed inside the surface described by any one of the arms connecting the rim of the steering wheel to the hub thereof, and said hub surrounds a fixed tubular support of the safety device and constitutes the shaft of the steering mechanism driving system.

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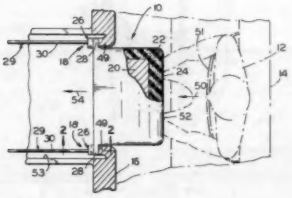
**3,744,818**

## ENERGY ABSORBING FASTENER STRUCTURES

**Gary K. Sandberg, Oloha, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.**

**Filed Aug. 26, 1971, Ser. No. 175,209**
**Int. Cl. B60r *27/00***
**U.S. Cl. 280—150 B** **1 Claim**



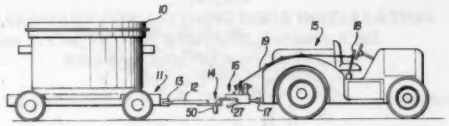
Padded panels are mounted in the dashboard areas of vehicles by energy absorbing fastener units. Split clamp dies swage wire fasteners when closed and draw the wire fasteners to absorb energy of impact. Another fastener structure includes an externally threaded nut and a washer-like die on a drawable rod. Another fastening structure includes a headed nut and a washer-like die on a drawable rod.

**3,744,819**

## COUPLING DEVICE FOR MOLTEN METAL CARRIER

**Henry S. Cook, and Robert E. Schwartz, both of Owensboro, Ky., assignors to National-Southwire Aluminum Company, Carrollton, Ga.**

**Filed Sept. 28, 1971, Ser. No. 184,383**
**Int. Cl. B60d *1/02***
**U.S. Cl. 280—477** **10 Claims**



This disclosure relates to a coupling device for connecting a molten metal carrier to a draft vehicle. The coupling device includes a pin slidable within a housing and engageable with a ring portion of a draw bar of the carrier. Actuation of the pin to engage and disengage the draw bar is accomplished by a cable connected to the pin and extending to a control lever in the draft vehicle. A guide ramp extending from the housing permits the operator of the draft vehicle to hook-up to the carrier as well as to engage and disengage the draw bar without alighting from the vehicle.

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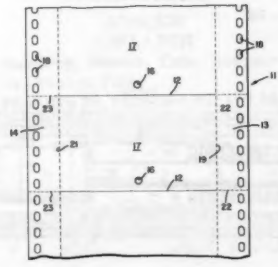
**3,744,820**

## CONTINUOUS LIBRARY CATALOG CARD

**Virgil V. Porter, 3433 Grasswood Drive, Richmond, Calif.**

**Filed Dec. 2, 1970, Ser. No. 94,445**
**Int. Cl. B42d *19/00***
**U.S. Cl. 281—5** **7 Claims**



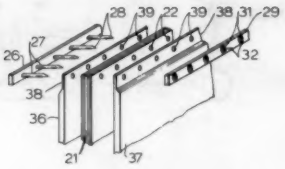
A continuous web for library catalogue cards having a plurality of slit lines longitudinally spaced 7.5 centimeters apart, each slit line extending 12.5 centimeters transversely between edge carrier portions of the form such that upon removal of the carrier portions outwardly of the slit lines a plurality of standard 7.5 centimeters × 12.5 centimeters catalogue cards are provided. Longitudinally extending lines of uniquely shaped feed holes or perforations are provided in the carrier portions of the form which permit printing of the cards by means of existing high speed printers of United States manufacture despite the cards being dimensioned in the metric system and the feed of the printers being dimensioned in the English system.

**3,744,821**

## BOOK AND METHOD OF FORMING SAME

**William H. Abildgaard, and Charles T. Groswith, III, both of Sunnyvale, Calif., assignors to Abildgaard Laboratories, Inc., Sunnyvale, Calif.**

**Filed Sept. 23, 1971, Ser. No. 183,038The portion of the term of this patent subsequent to Aug. 3, 1988, has been disclaimed.**
**Int. Cl. B42d *1/06***
**U.S. Cl. 281—21** **17 Claims**




Book covers are attached to the sheets comprising the book by means of spaced plastic studs which pass through aligned holes in the covers and sheets. The studs project from a first plastic strip, which strip is positioned on one side of the book adjacent the spine edge. A second strip having holes spaced complementary to the studs is positioned on the opposite side of the book. The strips are pressed toward each other, the excess stud lengths are cut off near the outside of the second strip, and heads are formed on the severed ends of the strips, holding the strips, case, and sheets bound together. The case consists of two covers each formed with a flexible region just to sides of the strips opposite the spine which makes it possible to open the book to expose areas close to the spine.

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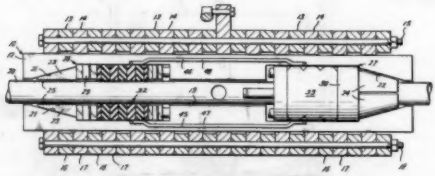
**3,744,822**

## APPARATUS FOR A SEALING EXTERNAL SURFACE OF A TUBULAR MEMBER

**James F. Arnold, Baytown, Tex., assignor to Hydro Tech Services, Inc., Houston, Tex.**

**Filed Jan. 15, 1971, Ser. No. 106,726**
**Int. Cl. F16l *35/00***
**U.S. Cl. 285—18** **8 Claims**



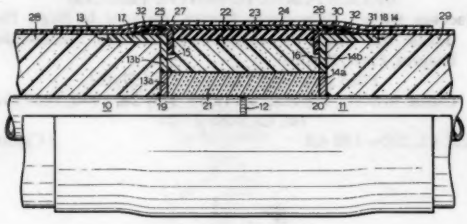
A segmented housing adapted for clamping about a tubular member, with a resilient packer mounted about the tubular member and within the housing. A fluid actuated piston carried by the housing is adapted to apply an axial engaging force to the packer to sealingly engage it with the tubular member. Also disclosed are circumferentially disposed slips mounted in the housing and arranged to move radially into engagement with the tubular member in response to the axial piston force. A plurality of longitudinally spaced packers and slips and longitudinal inter-packer seals are provided in some embodiments which are useful for clamping about an opening in a tubular member or for use with a tapping apparatus to cut openings in pressurized pipes.

**3,744,823**

## HIGH TEMPERATURE PIPELINE JOINTS

**John Muir, and Ivan Marshall Payne, both of Rexdale, Ontario, Canada, assignors to Shaw Pipe Industries Ltd., Rexdale, Ontario, Canada**

**Filed Feb. 25, 1972, Ser. No. 229,400**
**Claims priority, application Canada, Mar. 1, 1971, 106,476; Belgium, Oct. 8, 1971, 109,111**
**Int. Cl. F16l *13/02***
**U.S. Cl. 285—21** **11 Claims**



A joint between pipe sections of a pipeline capable of operating at high temperatures has the adjacent pipe sections welded together. Prior to joining, each section can be passed, if necessary, through an apertured, rigid, water, impermeable end cap which can be welded to the respective pipe section. Located between the ends of the factory applied insulation, and surrounding the welded joint, is a sleeve of asbestos surrounded by a sleeve of polyurethane. Overlying and sealed to the polyurethane is a polyethylene sleeve, heat sealed in position.

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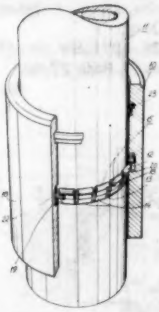
**3,744,824**

## PIPE COUPLINGS

**Erling Roos, Skien, Norway, assignor to Granges Essem AB, Vasteras, Sweden**

**Continuation of Ser. No. 50,037, June 26, 1970. This application June 26, 1972, Ser. No. 266,466**
**Int. Cl. F16l *37/12***
**U.S. Cl. 285—317** **7 Claims**



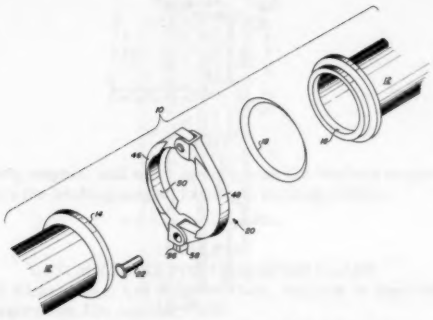
A pipe coupling arrangement in which one end of two pipes being connected together is adapted to be passed over the opposing end of the other pipe, and in which at least one circumferential, radially open groove is arranged in opposing sides of the pipes in coupled position, in which are provided pivotable locking means mounted on a spring ring and adapted to engage the opposing grooves in said pipe ends to prevent the pipes from being separated in a direction opposite to that in which they are coupled.

**3,744,825**

## TUBE JOINT COUPLING DEVICE

**Gary M. Cooper, Fort Worth, Tex.; Bruce Gilbert, San Diego, Calif., and James M. Estes, Fort Worth, Tex., assignors to General Dynamics Corporation, Ft. Worth, Tex.**

**Filed Apr. 27, 1972, Ser. No. 248,194**
**Int. Cl. F16l *23/00***
**U.S. Cl. 285—407** **3 Claims**



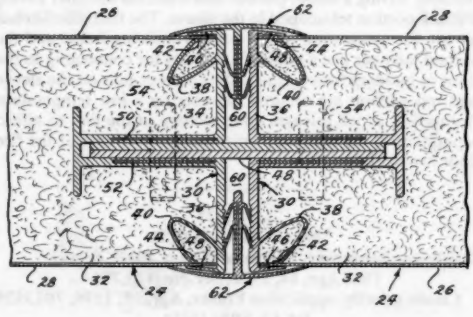
A tube joint coupling device particularly adapted for use with V-flange "Conoseal" type tube joints which comprises a pair of C-shaped clamps hingedly connected on one end and having means on the other end for mutually cooperative engagement and locking and means providing for bottoming out of the two halves without regard to torque when the clamps have reached the "secured" position, each C-shaped clamp having a V-groove providing for wedging or camming the flanges of the tubes to be jointed, the camming action of the V-groove being cooperatively assisted by an approach ramp, the V-groove having a "full engagement" portion encompassing substantially 120° of the circumference of the V-flanges in two equal and opposite segments, whereby the coupling eliminates virtually all installation errors and improves the joint effectivity attainable with presently utilized devices.

**3,744,826**

## MEANS FOR CONNECTING STRUCTURAL MEMBERS TOGETHER

**Frederick L. Hawes, Ladue, Mo., assignor to Tetra Plastics, Inc., Chesterfield, Mo.**

**Filed July 12, 1971, Ser. No. 161,745**
**Int. Cl. F16b *5/00***
**U.S. Cl. 287—189.36 D** **18 Claims**



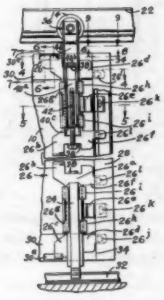
Improved means for connecting members together, such as members used in various types of structures including structures formed by connected members which may be filled with a filler material for some purpose, said filler material cooperating with the connected members to strengthen the structures. The subject means may, for example, be used for attaching edging strips to sheet members or walls to form a structural connection therebetween, and such connection using the subject means can be accomplished easily and quickly even at an assembly and installation site, if necessary.

**3,744,827**

## HARDWARE FOR A SLIDING DOOR INSTALLATION

**Arthur T. Cox, 18311 E. Railroad St., Industry, Calif.**

**Filed Sept. 30, 1971, Ser. No. 185,222**
**Int. Cl. F16b *7/00***
**U.S. Cl. 287—189.36 H** **6 Claims**



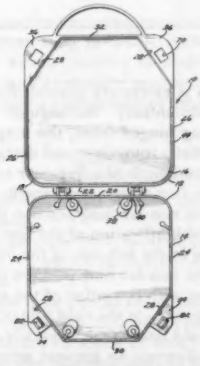
A sliding door installation in a doorway. Framed door panels are guided over threshold trackways and suspended from roller wheels in trackways at the top of the doorway. Corner brackets interconnect rails and stiles framing the door panels. Identical brackets interchangeably untilizable to carry roller wheels or floating guides interconnect the rails and stiles at the corners of the door panels. The brackets include three spurred lugs for securing the brackets to the rails and stiles. The rails and stiles are designed to be interconnected by the brackets to form a sturdy frame around the door panel edges.

**3,744,828**

## LID LATCH

**Norman P. Goldberg, Denver, Colo., assignor to Goldberg Brothers, Inc., Denver, Colo.**

**Filed July 29, 1971, Ser. No. 167,355**
**Int. Cl. E05c *5/04***
**U.S. Cl. 292—59** **6 Claims**



This invention relates to a latch for container lids and the like characterized by a spring-returned plunger mounted

within aperture in a marginal plunger-carrying ear for both rotational and reciprocating motion. The plunger includes a head of rectangular cross section which, when properly oriented, will pass through an opening therefor provided in a latch-receiving ear carried by the mating container part. This plunger head has the surface thereof adjoining its shank shaped to define a ridge adapted upon being depressed and rotated a quarter turn to seat within a transversely-extending notch in the opposing surface of the ear.

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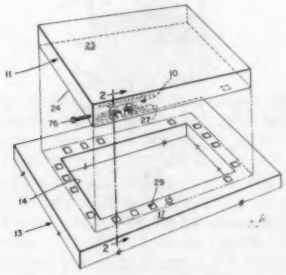
**3,744,829**
**DOOR LOCK APPARATUS**
**John A. Germer, c/o The Budd Company, 2450 Hunting Park Avenue, Philadelphia, Pa.**
**Filed Jan. 18, 1971, Ser. No. 107,194**
**Int. Cl. E05c** *9/00*
**U.S. Cl. 292—22** **10 Claims**



Linear differential lock apparatus in which lock elements linked to pinions are activated by racks to either bodily translate or rotate. When one rack is moved one of the lock elements will tighten, the easiest to move. Upon this lock meeting resistance, another lock element, the next easiest, will move. The apparatus is effective so that the force on all the lock elements when in operation is the same.

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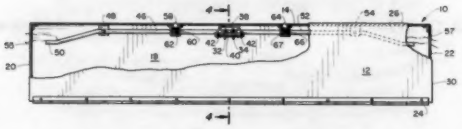
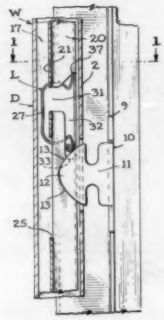
**3,744,830**
**SAFETY MEDICINE CABINET**
**Walter R. Levack, 7900 Chase Avenue, Los Angeles, Calif.**
**Division of Ser. No. 8,490, Feb. 4, 1970, Pat. No. 3,637,245.**
**This application Dec. 13, 1971, Ser. No. 207,352**
**Int. Cl. E05c** *9/00, 19/10*
**U.S. Cl. 292—29** **6 Claims**



A cabinet which is extremely difficult for a child to open comprising a substantially rectangular box having a downwardly opening hinged front, the longest dimension of said box is substantially transverse and designed to be greater than the normal arm length of a five-year old child, the front latched in place by first and second gravity latches, the first latch movable to the non-latching position through the use of a first pivotal bar with operation of the first pivotal bar being through an opening in the left side of the cabinet, the second latch movable to the non-latching position through the use of a second pivotal bar with operation of the second pivotal bar being through an opening in the right side of the cabinet, each of the first and second latches are interiorly spaced from their respective sides a distance to prevent actuation by a child, both the first and second latches must be in the non-latched position to permit opening of the cabinet.

**3,744,831**
**UNITARY LOCKER DOOR LATCH**
**Thomas A. Joseph, Farrell, Pa.; Earl P. Leiter, Louisville, and Harold P. Lhota, North Canton, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio**
**Filed Feb. 10, 1972, Ser. No. 225,176**
**Int. Cl. E05c** *1/06*
**U.S. Cl. 292—81** **12 Claims**



A door latching mechanism includes a rigid hook element mounted upon one component of an enclosure and cooperating with a spring latch member of substantially C-shaped configuration mounted upon another component of the enclosure. A lock bar is provided of improved construction adapted to receive and retain the spring latch member without the use of separate fastening elements.

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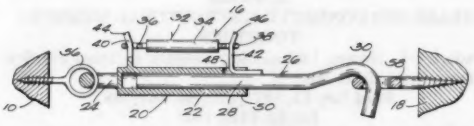
**3,744,832**
**FUSIBLE DOOR HOLDING DEVICE**
**Robert W. Casey, and Timothy R. Casey, both of 2362 N. 49 St., Milwaukee, Wis.**
**Filed Sept. 5, 1972, Ser. No. 286,485**
**Int. Cl. E05c** *19/10*
**U.S. Cl. 292—101** **5 Claims**



A door hold open device for a fire door includes a first member having a sleeve portion and a second member having a shank portion telescoped in the sleeve. The first member has an eye for connection to the door or building frame and the second member has a hooked extremity for connecting to the door or building frame. Upstanding pegs or pins on the sleeve and rod portion are secured together by a low temperature fusible link which releases upon melting of the link to afford separation of the telescoped members and release of the fire door to a closed position.

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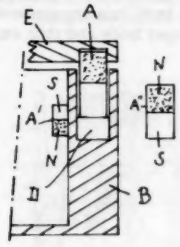
**3,744,833**
**MAGNETIC LATCH**
**Dominique Berducone, 18 Rue de la Vega, Paris, France**
**Filed Apr. 14, 1971, Ser. No. 133,796**
**Claims priority, application France, Apr. 15, 1970, 7013539**
**Int. Cl. E05c** *19/16*
**U.S. Cl. 292—251.5** **1 Claim**

A magnetic latch comprises a pair of magnets in mutually repelling position so that one of them is urged into a latching

position, and a third magnet which when brought close to the latching magnet overcomes the repulsion and withdraws the




latching magnet, and when remote from the latching magnet permits the latching magnet to resume latching position.

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**3,744,834**

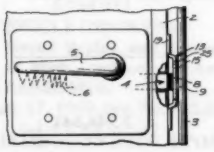
**LATCH STRIKE FOR COMBINED LOADS**

**Lloyd Richard Poe, Los Angeles, Calif., assignor to Hartwell Corporation, Los Angeles, Calif.**

**Filed Feb. 1, 1972, Ser. No. 222,473**

**Int. Cl. E05c *1/16***

**U.S. Cl. 292—302** **4 Claims**



A vehicle door lock having a pair of strike members one mounted on the door, the other mounted on the frame and capable of interlocking engagement when the door is closed. The door strike fitting between the frame strike and the frame; and the frame strike fitting between the door strike and door so as to prevent a spreading movement in the plane of the door, both strikes being engaged by a common latch bolt.

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**3,744,835**

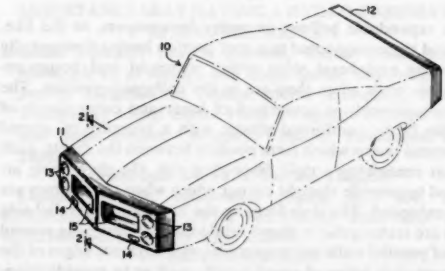
**SHOCK ABSORBING HONEYCOMB BUMPER**

**Angelo F. Carbone, Brooklyn, N.Y.; Clinton F. Egerton, Stamford, Conn., and Emmanuele Fallacaro, Commack, N.Y., assignors to Angelo F. Carbone, Clinton F. Egerton and Emmanuele Fallacaro, a part interest to each**

**Filed Nov. 26, 1971, Ser. No. 202,281**

**Int. Cl. B60r *19/04, 27/00*; B61f *19/04***

**U.S. Cl. 293—1** **3 Claims**




An automobile bumper constructed from plastic, metallic or paper honeycomb material, and covered by a rubber, metal or plastic shell which may be silvered to provide a simulated chrome bumper. The bumper is shock absorbent to reduce damage to the fenders and body of the automobile during slow speed crashes.

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**3,744,836**

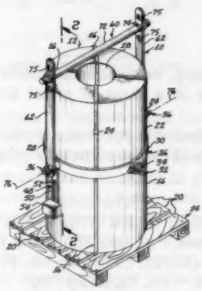
**CARRIER**

**Adam D. Goettl, 4960 E. Palomino Drive, Phoenix, Ariz.**

**Filed Feb. 7, 1972, Ser. No. 224,169**

**Int. Cl. B66c *1/18***

**U.S. Cl. 294—67 BA** **10 Claims**



A carrier for demountable attachment to an elongated cylindrical article such as a coil of sheet metal which facilitates moving and handling of the article.

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**3,744,837**

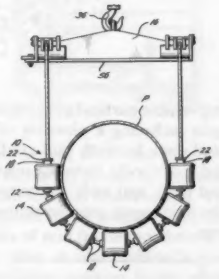
**PIPE SLING**

**Robert D. Foster, 773 Pifer, Houston, Tex.**

**Continuation of Ser. No. 804,948, March 6, 1969, abandoned. This application Mar. 26, 1971, Ser. No. 128,589**

**Int. Cl. B66c *1/12***

**U.S. Cl. 294—74** **3 Claims**



A load supporting sling or cradle including an elongated support element with a plurality of load-engaging members mounted on the support element in preselected positions and adapted to be in rolling engagement of the load.

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**3,744,838**

**FRICTION CLAMP**

**Robert Alvin Jackson, 6565 Aubrey St., Burnaby, British Columbia, Canada**

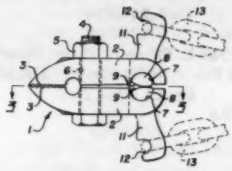
**Filed Jan. 28, 1972, Ser. No. 222,066**

**Int. Cl. B25b *5/08***

**U.S. Cl. 294—116** **9 Claims**

A clamp formed from two identical clamp members interconnected by an adjustable bolt which passes through them. The clamp is actuated by a pair of rotary cams journalled in cylindrical recesses in opposed faces of the clamp members, the cams having convex interengaging cam faces so that when

rotated together in contact they spread the clamp members at one end of the clamp and thereby close the ends at the other end of the clamp. This arrangement is of particular value in the repair of automobile bodies which have been damaged, since a sheet of metal can be engaged either at the end or at



the side of the clamp, or the clamp members may be located one on each side of a sheet of metal and bolted together through the sheet.

In a variant, adjustable jaws are provided on the clamp to facilitate the lifting of blocks of material of varying widths.

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**3,744,839**

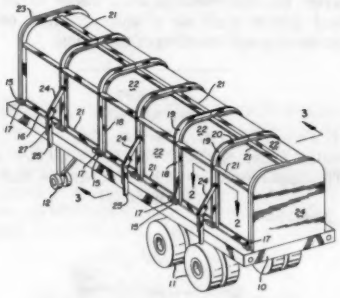
## INGOT CARRYING VEHICLE

**Jerry L. Stoneburner, P.O. Box 277, North Jackson, Ohio**

**Filed Oct. 21, 1971, Ser. No. 191,379**

**Int. Cl. B60p** *7/02*

**U.S. Cl. 296—1 R** **7 Claims**



An ingot carrying vehicle particularly adapted for transporting hot metal ingots including a plurality of ingot receiving cradles, an insulated deck beneath said cradles and a pair of oppositely disposed sidewardly movable insulated cover sections hinged to said deck and ends for completely enclosing said ingots whereby said ingots may be shipped without critical temperature loss.

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**3,744,840**

## TWO-PIECE UNITS LONGITUDINALLY ADJUSTABLE WITH EACH END TERMINATING IN MEANS INTERLOCKING A CAMPER BODY WITH A TRUCK BODY

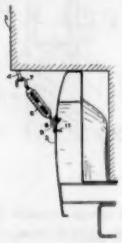
**Marvin A. Van Cleave, 5712 Portland Road N.E., Salem, Oreg.**

**Filed Sept. 23, 1971, Ser. No. 182,964**

**Int. Cl. B60p** *3/32*

**U.S. Cl. 296—23 MC** **2 Claims**

A camper and truck body mounting and interlocking means comprising at least four identical two-piece units. One part of each unit is secured to each of the four corners of a truck body for interlocking securement to the other pieces of said units which are secured in like manner to the four corners of the camper body. One part of each unit comprises an anchor plate adapted for either removable or permanent securement to the side walls of the truck body. Each anchor plate has a central opening therethrough for hooked engagement with a hook at the bottom end of the other part of the unit. Said other part also comprises a turnbuckle provided with a companion hook at its top end for engagement with an eye bolt, U-bolt, or the like, secured to and depending from the respective corner of the camper body. The turnbuckle extends upwardly and rearwardly from the truck body into engagement with the U-bolts or clevises of the camper body and thus enables the camper



body to be pulled forward into solid and properly positioned securement to the truck body. By this arrangement, whereby lineal forces acting in opposite directions through each of the units, a single couple constituting a single force by the aligned hook components, an equilibrium is produced. Equilibrium is produced relative to the lineal force or forces radiating from the central opening in the anchor plate.

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**3,744,841**

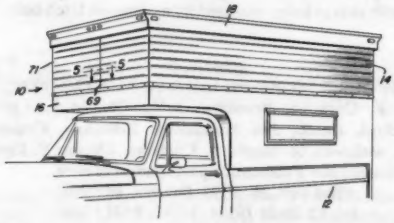
## CAMPER WITH EXPANDABLE TOP

**Leo Schmidt, 8500 Second Street N.W., Albuquerque, N. Mex.**

**Continuation-in-part of Ser. No. 863,981, Oct. 6, 1969, Pat. No. 3,622,193. This application May 11, 1971, Ser. No. 142,281**

**Int. Cl. B60p** *3/34*

**U.S. Cl. 296—27** **7 Claims**



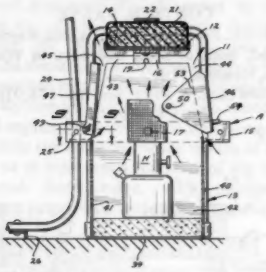
An expandable bellows assembly for campers, or the like, adapted to be connected to a roof portion having downwardly extending peripheral sides which surround and house expandable walls when they are in the collapsed position. The bellows assembly is comprised of inner and outer sheets of flexible fabric reinforced plastic with a plurality of spaced horizontal seams which form pockets between the sheets, each pocket containing a rigid fiber glass slat, the slats being arranged to provide straight corner edges when the bellows are fully extended. The slats forming the first pair of parallel side walls are rectangular in shape, while those forming the second pair of parallel walls are trapezoidal with adjacent edges of the adjacent slats being of equal length, such as to provide triangular sections of material which are free to flex as the bellows are collapsed and expanded.

3,744,842

## PORTABLE BLIND APPARATUS

Jacob A. Ronning, 3525 Irving Avenue, S., Minneapolis, Minn.

Filed Feb. 8, 1971, Ser. No. 113,449
Int. Cl. A47c 7/72
U.S. Cl. 297—180 2 Claims



Apparatus for forming a portable hunter's blind in which an adjustable seat for the hunter is disposed over a receptacle having a heating unit from which controlled heat may pass upwardly to warm the hunter, together with collapsible frame elements disposed about the seat to support reeds in simulation of a natural blind.

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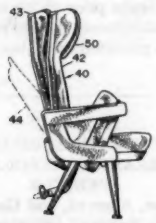
3,744,843

## VEHICLE CHAIR UNIT

Chester J. Barecki, Grand Rapids, and Kenneth W. Hozeski, Grandville, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Jan. 17, 1969, Ser. No. 792,031
Int. Cl. A47c 1/12
U.S. Cl. 297—316 1 Claim



A chair for a vehicle such as a bus or airplane wherein the back and seat portions are so interconnected to the frame that raising of the seat will automatically bring the back to upright position.

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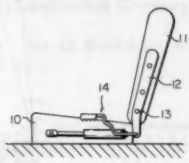
3,744,844

## ADJUSTABLE SEAT HAVING A HYDRO-PNEUMATIC SPRING MECHANISM

Masaaki Nomaki; Norimi Hozumi; Mizuo Otaki; Kenichi Maemori, all of Atsugi, and Shoju Sakai, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama; Atsugi Motor Parts Company, Limited, Atsugi and Ikeda Bussan Company, Limited, Yokohama, all of Japan

Filed June 24, 1971, Ser. No. 156,355
Claims priority, application Japan, July 24, 1970, 45/73533; July 24, 1970, 45/73534; Dec. 28, 1970, 45/132643; Dec. 28, 1970, 45/132644
Int. Cl. A47c 1/024
U.S. Cl. 297—355 18 Claims

An adjustable seat having a hydro-pneumatic spring mechanism which includes a cylinder connected to a seat back, a piston axially slidable in the cylinder, a piston rod projecting forwardly from the piston and connected to a seat structure and a valve connected to the piston rod to operatively engage with the piston. The cylinder has formed in its cylinder bore a gas compartment filled with a gas under pressure and a liquid compartment in which the piston and the valve are located. The cylinder together with the piston is rotatable relative to the piston rod through threads formed on



the connecting portions of the piston and the piston rod, causing the cylinder to axially move relative to the seat so that the seat back is angularly moved between upright and reclining positions. Arrangements may be made to prevent the piston from being over-screwed and consequently sticking to the piston rod due to application of excess torque to the cylinder. Such arrangements include means to limit the angle of rotation of the cylinder or means to cause the valve to be deformed elastically when depressed by the piston.

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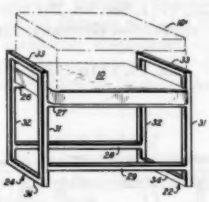
3,744,845

## COMBINATION BENCH, STOOL, AND PLAQUE TABLE

Harry Sooker, 36-36 202nd St., Bayside, N.Y.

Filed Feb. 24, 1972, Ser. No. 228,938
Int. Cl. A47c 9/12, 7/00, 7/14
U.S. Cl. 297—439 7 Claims



A combination bench, stool and plaque-table which provides maximum flexibility in use by utilizing a multiple position frame of solid integral construction. This frame has two rectangular frame members connected by cross bars attached to the longer sides of said frame members at various distances from the shorter sides. A seat cushion is provided which may rest upon the multiple position frame when it is in various positions to attain various height positions. One or more plaque-table tops may be provided to rest on the multiple position frame member so that several heights of table options are available. Special securing means are provided on the plaque-table top to hold it to the multiple position frame in any of its positions. The plaque-table top may have wall mounting means to secure it to a wall as a wall plaque or art piece for storage when not in use.

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3,744,846

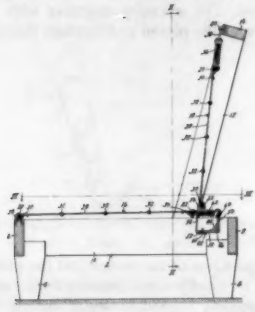
## SEATING CONSTRUCTION

Thomas W. Platt; Harmon W. Arnold, and Lloyd E. Tieman, all of Carthage, Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.

Filed Sept. 16, 1971, Ser. No. 180,974
Int. Cl. A47c 7/16
U.S. Cl. 297—452 10 Claims

A seating construction consisting of a frame, a generally horizontal seat deck panel, a generally vertical back deck

panel using from the rearward edge of the seat panel, a bellcrank lever pivoted in the frame on a horizontal transverse axis adjacent the juncture of the seat and back panels, and having upwardly and forwardly projecting arms, the forward edge of the seat panel being connected to the frame and its



rearward edge being connected by resiliently extensible members to the upwardly extending arm of the lever, the lower edge of the back panel being secured to the forwardly extending arm of the lever, and its upper edge being connected to the frame by resiliently extensible members.

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**3,744,847**

## APPARATUS FOR RECOVERING UNDERGROUND DEPOSITS OF SOLUBLE MINERALS

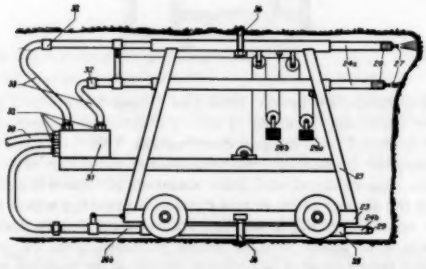
**Ernst Messer, Wathlingen, and Arno Singewald, Kassel-Wilh, both of Germany, assignors to Wintershall Aktiengesellschaft, Kassel, Sweden**

**Division of Ser. No. 4,727, Jan. 21, 1970. This application Nov. 22, 1971, Ser. No. 201,000**

**Claims priority, application Germany, Jan. 21, 1969, P 19 02 742.0**

**Int. Cl. E21b *43/28***

**U.S. Cl. 299—2** **5 Claims**



An apparatus for carrying out a method of recovering underground deposits of soluble minerals according to which an access shaft is sunk to the region of the deposit and a tunnel is driven from the shaft to the deposit, whereupon an upright working shaft is advanced from the tunnel into the deposit. From the working shaft a plurality of vertically spaced substantially horizontal and at least substantially parallel flushing passages are driven into the deposit, and intermediate these passages the deposit is formed with a plurality of slots each connecting two adjacent ones of the passages and inclined thereto. Water is forced through the passages and slots to dissolve soluble minerals from the deposit and the thus-obtained solution is collected in the respectively lower of the passages. The collected solution is at least substantially saturated with dissolved minerals by supplying it together with fresh water through the deposit to the next lower of the passages. The saturated solution is collected underground and thereupon pumped from below ground to above ground where the dissolved minerals are recovered and where residual water remaining after recovery of the minerals is returned into the passages.

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**3,744,848**

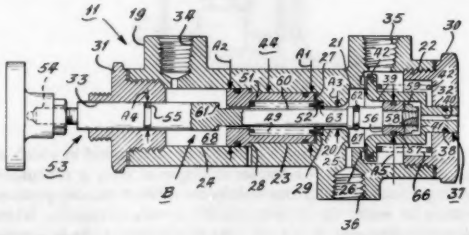
## CONTROL VALVE

**David R. Hardwick, Maryland Heights, and Raymond J. Kersting, Dellwood, both of Mo., assignors to Wagner Electric Corporation, Newark, N.J.**

**Filed Sept. 7, 1971, Ser. No. 178,010**

**Int. Cl. B60t *13/10***

**U.S. Cl. 303—9** **1 Claim**



A control valve is provided in a fluid pressure system with selectively operable means for controlling the application of fluid pressure from separate sources thereof to a spring setting, pressure released actuator for energizing a brake in an air brake system, and resiliently urged means are provided in said control valve to drive said selectively operable means to a position automatically venting said actuator and energizing said brake upon the occurrence of a predetermined low pressure at one of said sources. A uni-directional flow valve is provided in the control valve to prevent the reduction of fluid pressure at the brake actuator and the gradual spring setting energization of the brake prior to the automatic actuation of the selectively operable means by said resiliently urged means in response to the predetermined low pressure at the one source.

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**3,744,849**

## ARRANGEMENT FOR MEASURING THE SPEED OF A VEHICLE IN A BRAKE CONTROL SYSTEM OF THE VEHICLE

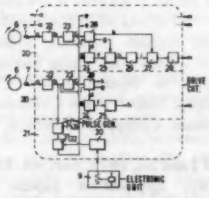
**Arne Holger Jonason, Angered, and Gosta Holger Granlund, Goteborg, both of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden**

**Filed Oct. 26, 1970, Ser. No. 83,745**

**Claims priority, application Sweden, Oct. 27, 1969, 14651/69**

**Int. Cl. B60t *8/10***

**U.S. Cl. 303—21 BE** **6 Claims**



In a brake control system of wheeled vehicles, particularly of motor cars, an arrangement measures the vehicle speed by means of an accelerometer of simple type to produce a signal representing the speed of a braked individual wheel relative to

the vehicle speed. The wheel is intermittently braked to be temporarily freelrunning without slip so that the true vehicle speed is repeatedly measured by an inductive or other speed transmitter. Furthermore, the vehicle speed is continuously, though inaccurately, measured by integration of the output of an accelerometer of a simple cheap type. This integrated output is repeatedly corrected by being updated with the true vehicle speed intermittently measured by the speed transmitter when the wheel is free-running. During those periods during which the wheel is braked and may be lagging (slipping), the measured wheel speed differs from the updated speed represented by the integrated and updated accelerometer output. By comparison of these two speed values, an electrical signal representing the slip is produced and may be used for temporarily releasing the brake means of the vehicle when slip occurs or at least when the ratio of slip to speed passes a predetermined limit value. Any accelerometer output representing a negative retardation, i.e. positive acceleration, is suppressed.

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**3,744,850**

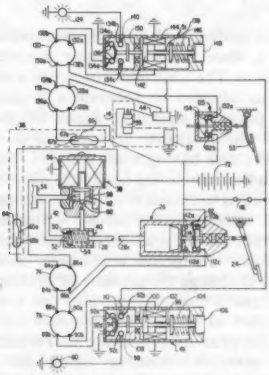
## AUTOMATIC TRACTION CONTROL SYSTEM

**Donald E. Barthlome, 313 Orange Plank Road, Hampton, Va.**

**Filed Mar. 8, 1971, Ser. No. 122,009**

**Int. Cl. B60t *8/12***

**U.S. Cl. 303—21 B** **11 Claims**



A wheel traction control system is disclosed which automatically detects a maximum-traction wheel slippage and controls brake and drive systems so as to maintain this maximum-traction wheel slippage. The system essentially includes a wheel slippage detector, an automatic braking control device and an automatic accelerating control device. The wheel slippage detector comprises an angular accelerometer and a linear accelerometer, which press against one another to measure the ratio of wheel angular acceleration to vehicular linear acceleration. If wheel slippage is caused by vehicular "braking action", the wheel slippage detector sends a control signal to the automatic braking control device and if wheel slippage is caused by vehicular "accelerating action", the wheel slippage detector sends a control signal to the automatic accelerating control device. The automatic braking control device includes a brake-fluid line valve which is biased toward the closed position but which is opened by brake-fluid flow in the direction of a wheel cylinder. Further, the valve is closed tightly in response to a signal from the wheel slippage detector. The automatic accelerating control device includes an oscillator and a relay. Essentially, the accelerating control device responds to a slippage-detector signal by intermittently interrupting a vehicle's ignition circuit. Safety devices are also included to deactivate the wheel traction control system in the event of malfunctions.

**3,744,851**

## BRAKE FORCE REGULATING SYSTEM FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

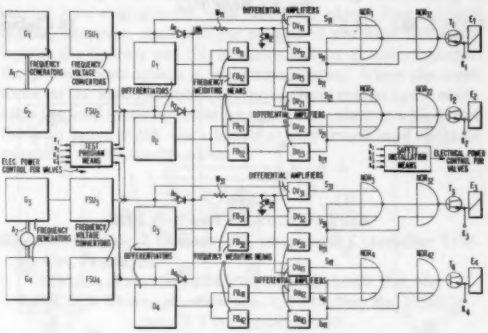
**Manfred H. Burckhardt, Waiblingen; Hans-Jorg Florus, Goppingen; Horst Grossner, Geradstetten(Wurtt.), and Helmut Krohn, Esslingen-Liebersbronn, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany**

**Filed July 7, 1970, Ser. No. 52,833**

**Claims priority, application Germany, July 22, 1969, P 19 37 123.4**

**Int. Cl. B60t *8/08, 8/12***

**U.S. Cl. 303—21 BE** **32 Claims**



A brake force control system for vehicles, in particular motor vehicles in which a sensing device is coordinated to each wheel for detecting its rotational speed condition, whose signals influence the brakes when exceeding or dropping below a predetermined threshold value; the sensing devices detect both the wheel slippage and also the acceleration of a wheel and the measuring magnitudes representing slippage and acceleration are combined into a signal magnitude representing the control pulse for the brakes.

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**3,744,852**

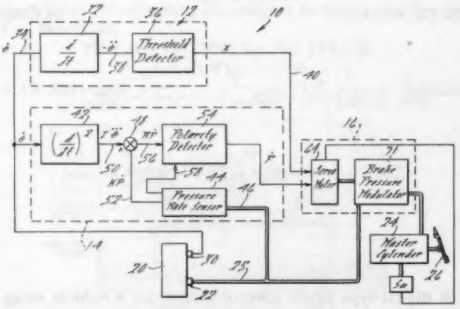
## SKID CONTROL SYSTEM

**Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.**

**Continuation of Ser. No. 859,776, Sept. 22, 1969, abandoned. This application Aug. 23, 1971, Ser. No. 174,277**

**Int. Cl. B60t *8/10***

**U.S. Cl. 303—21 P** **7 Claims**




A skid control system for a wheeled vehicle having a brake pressure modulator for relieving brake actuation in response to a first control signal which is representative of a detected skid condition and for modulating brake actuation thereafter

in accordance with the sign and magnitude of second control signal which is representative of the sum of the rate of change of wheel acceleration during spin up and the rate of change of brake pressure.

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**3,744,853**

**FLUID PRESSURE-OPERATED BRAKING SYSTEMS FOR VEHICLES**

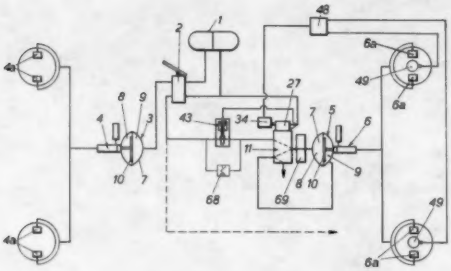
**John Leslie Cullen, and Alexander Frank Potter, both of Stratford-upon-Avon, Warwickshire, England, assignors to Girling Limited, Tynsley, England**

**Filed May 3, 1971, Ser. No. 139,747**

**Claims priority, application Great Britain, May 12, 1970, 22,759/70**

**Int. Cl. B60t** *8/12*

**U.S. Cl. 303—21 F** **18 Claims**



A booster-assisted pressure-operated braking system incorporates a normally open control valve assembly through which fluid under pressure is supplied to the booster to actuate a wheel brake actuator. The control valve assembly is adapted to close in response to a signal received from means responsive to the deceleration of a braked wheel and subsequently cause the pressure applied to the booster to be relieved.

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**3,744,854**

**DIGITAL-TYPE BRAKE-CONTROL METHOD AND SYSTEM**

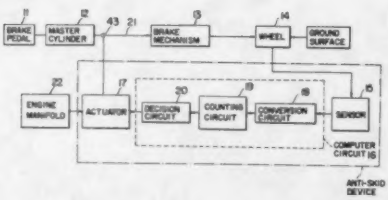
**Junichiro Ooya; Kazutaka Kuwana; Takashi Hida; Katuki Takayama, and Akira Tarao, all of Kariya-shi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan**

**Filed Aug. 9, 1971, Ser. No. 170,241**

**Claims priority, application Japan, Aug. 9, 1970, 45/69462; Sept. 10, 1970, 45/79608; Sept. 10, 1970, 45/79609; Sept. 16, 1970, 45/81093**

**Int. Cl. B60t** *8/10*

**U.S. Cl. 303—21 P** **14 Claims**




A digital type brake control system for a vehicle using a hydraulic brake system, wherein the hydraulic brake system of a vehicle is controlled by detecting the rotational state of a wheel of the vehicle to produce a detection output, converting this output into a pulse signal, comparing and calculating the difference between the number of the pulses of this signal counted from any given first instant for a specific period and the number of the pulses counted from an instant other than the first instant for a specific period, determining whether this difference is greater or less than a predetermined reference pulse number, and accordingly, producing a pressure-variation signal thereby to vary the hydraulic pressure in the brake system. All operations are accomplished through the consistent use of only digital signals.

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**3,744,855**

**SKID CONTROL DEVICE**

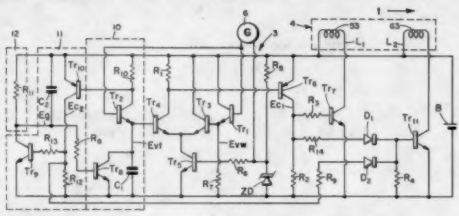
**Takeshi Ochiai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan**

**Filed Nov. 4, 1971, Ser. No. 195,564**

**Claims priority, application Japan, Dec. 30, 1970, 45/122433**

**Int. Cl. B60t** *8/08*

**U.S. Cl. 303—21 BE** **6 Claims**



A skid control device comprising a wheel velocity detector for generating a wheel velocity voltage, a controller and a pressure modulator. The controller comprises a wheel velocity setting apparatus adapted to generate a pressure reducing signal and a pressure applying signal by detecting the deceleration of wheel velocity encountered during braking, the deceleration curve having a set gradient. The controller also comprises a first correcting apparatus adapted to correct the set gradient so as to decrease it in accordance with the increase in wheel velocity, and a second correcting apparatus adapted to correct the set gradient so as to increase it. The pressure modulator comprises a pressure modulating apparatus adapted to change the pressure of braking fluid of the wheel cylinder, and a change-over valve and a throttle valve which are adapted to actuate the pressure modulating apparatus so that the pressure of braking fluid is decreased upon receiving the pressure reducing signal and the thusly decreased pressure of braking fluid is increased again at a different speed upon receiving the pressure applying signal.

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**3,744,856**

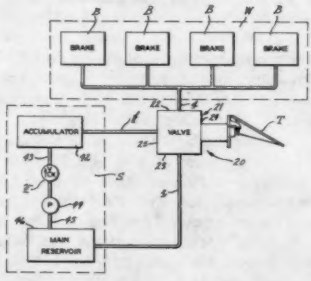
**PRESSURE MODULATING BRAKE VALVE**

**Richard A. Doversberger, Peoria, Ill., assignor to Westinghouse Air Brake Company, Peoria, Ill.**

**Filed Nov. 3, 1971, Ser. No. 195,144**

**Int. Cl. B60t** *15/12*

**U.S. Cl. 303—54** **3 Claims**




A pressure modulating brake valve interposed between a fluid pressure accummulator and the brake line of a vehicle

for selectively directing a volume of pressurized fluid to the vehicle brakes responsive to the application of the brake treadle, which urges a plunger to unseat a poppet valve located within the brake valve; the fluid pressure in the brake line also impinges against the plunger to offset the manual pressure exerted thereon and to permit the operator to feel the fluid pressure application. The brake valve also communicates the brake line with the vehicle main fluid reservoir, the plunger having a fluid bypass for permitting return flow when the fluid pressure in the brake line exceeds the manual pressure exerted on the brake treadle.

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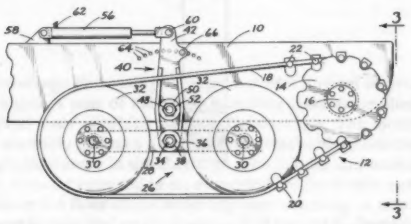
**3,744,857**

## TRACK MOUNTING AND TENSIONING ASSEMBLY FOR TRACKED VEHICLES

**Richard H. A. Schoonover, West Linn, Oreg., assignor to Formac International, Inc., Seattle, Wash.**

**Filed Apr. 26, 1971, Ser. No. 137,454**
**Int. Cl. B62d** *55/30*
**U.S. Cl. 305—10** **11 Claims**



A track mounting and tensioning assembly for track-type tractors and other tracked vehicles includes an endless sprocket-driven track, and a walking beam-bogey wheel assembly engaging the track. The walking beam-bogey wheel assembly is supported on a vertical lever pivotally connected intermediate its ends to the frame of the vehicle. The lower end of the lever is pivotally connected to an intermediate point on the walking beam. The upper end of the lever is pivotally connected to power means such as a fluid operated cylinder which applies pressure to the lever in the direction of track tensioning. The bogey wheels themselves thus become the tensioning instrumentalities which maintain the track under constant tension despite track length changes which normally occur during operation of tracked vehicles over rough terrain.

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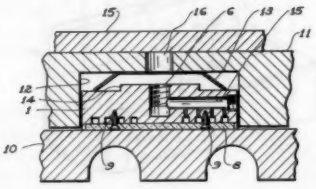
**3,744,858**

## GAS BEARINGS

**Richard H. Weichsel, Hudson, Ohio, assignor to The Apex Bearings Company, Hudson, Ohio**

**Filed June 15, 1971, Ser. No. 153,371**
**Int. Cl. F16c** *17/00*
**U.S. Cl. 308—5 R** **5 Claims**



A gas bearing for carrying a work load to any desired location including a circular housing having a cavity in which is arranged spaced grooves separated by ribs or lands. The bearing also has a peripheral flange which extends upwardly from the body of the housing and receives a porous plate which engages the lands and covers the grooves. Means are also provided for passing a gas ino the housing. When the bearing plate is inverted, the porous plate rests on a track or base plate and when gas passes through the porous plate, the bearing may be easily rotated or moved in a linear direction . The bearing may be of any desired size, such as from approximately one-fourth inch in diameter up to the requirement of the load to be carried in relation to the avaialbel gas supply. Two or more of the bearings may be used in tandem when the load so requires. To protect the bearing when the load is heavy, a plate which carries the work or forms part of it is provided with a counter bore which is held in spaced relation to the base plate by resilient means, such as a Bellevile washer, the lower portion of which surrounds a boss on the bearing, while work, such as shearing, stamping or forging is being performed on the load, the bottom portion of the plate surrounding the bearing is moved into engagement with the base plate. The resilient means, however, prevents the weight of the load from collapsing the bearing and this is particularly true with respect to the porous plate which is maintained intact. When the work force on the load isterminated, the resilient means again maintains the load in spaced relation to the base plate at which time the load upon which work has been performed may again be moved to any desired position.

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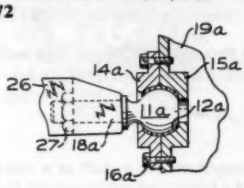
**3,744,859**

## MULTI-PART BEARING LINER

**Reginald K. Ringel, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Division of Ser. No. 824,979, May 15, 1969, Pat. No. 3,597,025. This application Jan. 4, 1971, Ser. No. 103,924**
**Int. Cl. F16c** *23/00, 33/20*
**U.S. Cl. 308—72** **5 Claims**



A bearing assembly comprises a multi-part, semi-rigid bearing liner having a tang formed on at least one of the parts thereof. A recess, formed in the bearing assembly, mounts the tang therein to mechanically anchor the liner in position. In one illustrated embodiment, the recess is formed in a socket member of the bearing assembly whereas in a second embodiment the tang and recess are formed on adjacent parts of the bearing liner.

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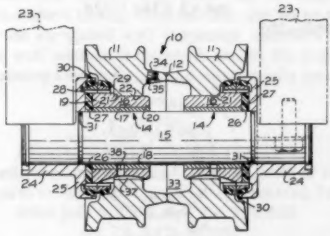
**3,744,860**

## BEARING ARRANGEMENT FOR IDLER WHEELS

**Robert Casey, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed July 19, 1971, Ser. No. 163,628**
**Int. Cl. F16c** *13/02*
**U.S. Cl. 308—109** **7 Claims**



A bearing arrangement for rotatably mounting an idler wheel about a stationary shaft comprises a bushing having a

raised annular shoulder adjacent a cylindrical end portion defining a radial face therebetween. The face abuts one end of a bore formed in the idler wheel for mounting the cylindrical end portion of the bushing. The outer end of the bushing is adjacent an annular face of a supporting bracket whereby axial thrust loads transmitted into the bushing by means of the radial face are imparted into the supporting member without being first transmitted through the shaft.

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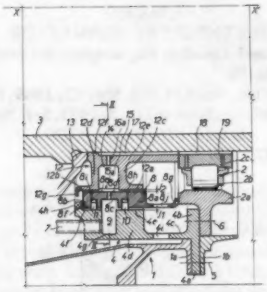
**3,744,861**
**BEARING**

**Jean Georges Bouiller, Brunoy; Raymond Jean Maurice Joubert, Savigny-sur-Orge; Louis Jules Bauger, deceased, late of Vanves, France; by Madeleine Henreitte Aimee Bauger, executrix, Vanves; Jeane Denise Olivier, La Ferte-Bernard, and Armand Jean Baptiste Lacroix, Itteville, all of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France, by said Bouiller, Joubert and Lacroix**

**Filed Mar. 1, 1972, Ser. No. 230,637**
**Claims priority, application France, Mar. 1, 1971, 7106952**
**Int. Cl. F16c *33/66***
**U.S. Cl. 308—187** **3 Claims**



A bearing arrangement for a shaft or a rotor comprising a main bearing and a lubricated safety journal bearing, in which the safety journal bearing comprises a revolving journal member integral with the shaft or rotor and a bearing member mounted with radial play in a stationary support and centered therein by the pressure in a chamber formed by parts of the bearing member and support and sealed by joints which provide the tightness of the radial play while allowing the bearing member to move radially, and in which the chamber is supplied with lubricating fluid under pressure which passes through channels in the bearing member to a radial clearance between the bearing member and the journal member to lubricate the safety bearing.

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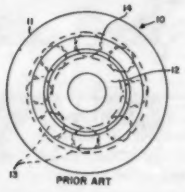
**3,744,862**
**HIGH STRENGTH, HIGH TEMPERATURE SELF-LUBRICATING BEARING RETAINER**

**Kenneth P. Schwartz, 2604 Cross Country Road, Dayton, Ohio**

**Filed Mar. 1, 1972, Ser. No. 230,694**
**Int. Cl. F16c *19/20***
**U.S. Cl. 308—201** **1 Claim**




A filament-wound rolling bearing retainer member fabricated from a high strength, lightweight and high temperature-resistant, self-lubricating material continuously wrapped in fiber form, together with a bonding matrix, on a bias around a mandrel, coated with a release agent, to form a basic shell thereafter removable from the mandrel and machined into the desired retainer configuration.

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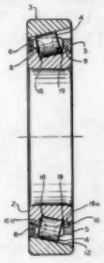
**3,744,863**
**CYLINDRICAL ROLLER CONICAL BEARING**

**William J. Derner, Manlius, and Harold E. Stewart, Central Square, both of N.Y., assignors to Rollway Bearing Company, Inc., Syracuse, N.Y.**

**Filed Sept. 10, 1971, Ser. No. 179,455**
**Int. Cl. F16c *19/00***
**U.S. Cl. 308—214** **2 Claims**



A cylindrical roller conical bearing capable of transmitting combination thrust and axial loads. This is accomplished by providing a bearing in which the inner and outer races have tapered roller contacting surfaces, the contacting surfaces being parallel to and spaced from each other so that a frusto-conical path is formed therebetween. A plurality of flattened cylindrical rollers are positioned between and are contiguous with the tapered contacting surfaces such that the rollers move freely around the frusto-conical path without suffering from inherent slippage.

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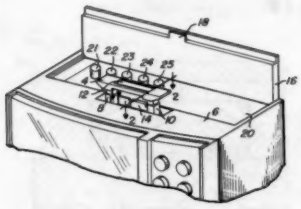
**3,744,864**
**INTEGRAL HANDLE AND COVER RELEASE MECHANISM FOR AN ELECTRONIC EQUIPMENT CABINET**

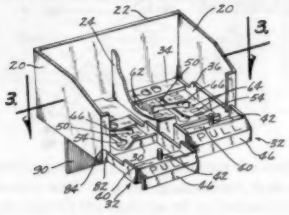
**Raymond J. Schmitz, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Apr. 10, 1972, Ser. No. 242,560**
**Int. Cl. A47b *95/02***
**U.S. Cl. 312—244** **13 Claims**



A retractable carrying handle and cover release mechanism for an electronic equipment cabinet having a latchable access cover in one of the side walls thereof for providing access to the equipment controls. A pushbutton, provided within the carrying handle, operates to release the cover when the handle is in a retracted position, but does not allow the cover to be released when the handle is in an extended carrying position.

3,744,865
**MOUNTING BASE ASSEMBLY FOR PRODUCT CARTRIDGES**
Martelle J. Syverson, Albert Lea, Minn., assignor to Fountain Industries, Inc., Albert Lea, Freeborn County, Minn.
Filed Mar. 27, 1972, Ser. No. 238,448
Int. Cl. A47f *3/026*; B67d *5/06*
U.S. Cl. 312.35 11 Claims



A beverage dispensing machine includes a panel of product cartridges. A pair of cartridge mounting base assemblies are provided each of which holds two cartridges. The mounting base assembly includes a handle unit detachably connected to an agitator handle in the cartridge. The handle unit includes a guide element received in an elongated longitudinally extending slot in the floor of the mounting base assembly. A retaining element is provided on the lower end of the guide element and is of such a size that it will only pass through an enlarged opening in communication with the elongated slot for assembly and disassembly of the mounting base assembly. Two rows of stop openings are provided on opposite sides of the elongated slot to receive the legs of a stop element bridging the slot. The openings in each of the rows are staggered relative to each other whereby either leg of the stop element may be selectively placed in one of two openings to vary the amount of travel of the handle unit towards an open position.

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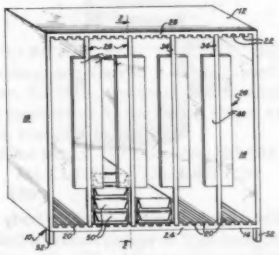
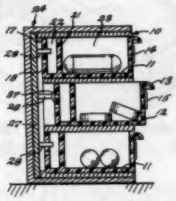
3,744,866
**DISPLAY AND DISPENSING BIN**
Robert L. Cook, 1628 N. 17th St., Belleville, Ill.
Filed July 29, 1971, Ser. No. 167,153
Int. Cl. A47f *1/00*
U.S. Cl. 312—42 9 Claims



Display, storage and dispensing rack for packages having a parallelogram shape and laterally moveable and adjustable flanged partitioning elements to enclose packages of any selected size in a stack, the partitioning elements having extending diagonally disposed points insertable in oppositely paired upper and lower grooves to secure the partitioning elements.

3,744,867
**PROGRAMMED DISPENSER**
Joseph D. Shaw, 508 Church St., Brownsville, Pa.
Continuation of Ser. No. 99,165, Dec. 17, 1970, abandoned.
This application Apr. 3, 1972, Ser. No. 240,869
Int. Cl. A47b *67/02*
U.S. Cl. 312—234 7 Claims



A programmed dispenser particularly useful for the dispensation of prescribed pharmaceuticals to hospital patients and having a cabinet containing individually coded drawers for the pharmaceuticals and an indexed selector means adapted to periodically receive the cabinet to thereby open certain drawers into a dispensing position.

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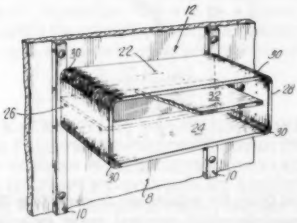
3,744,868
**FURNITURE CONSTRUCTION**
Joseph Reiter, 11255 Suzor Cote, Montreal, Quebec, Canada (356)
Filed Apr. 7, 1972, Ser. No. 242,092
Int. Cl. A47f *5/08*; A47b *47/04*
U.S. Cl. 312—263 5 Claims



A cabinet or a piece of furniture, preferably cabinets in a wall system, wherein the side and top walls are made of laminated square elongated members and the joints of these wall members are curved and made up of short curved laminated members having cross section similar to the cross section of the elongated wall laminated members with the grain in the wall laminated members and in the curved joint members running longitudinally and substantially parallel.

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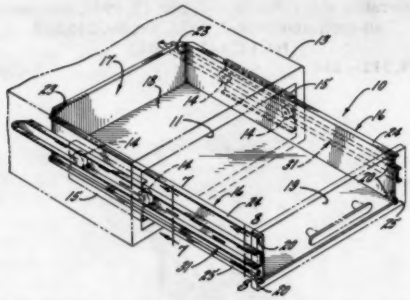
3,744,869
**DRAWER WITH GUIDE TRACKS**
Lloyd L. Anderson, and Richard L. Bildahl, both of Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed July 6, 1971, Ser. No. 159,882
Int. Cl. A47b *88/04*
U.S. Cl. 312—330 13 Claims

Channel-defining ribs are formed integrally on the side panels of a drawer made from a strip of extruded metal and the ribs support drawer-guiding tracks which coact with rol-

lers to slidably guide the drawer, the tracks interfitting dovetail fashion with the ribs. Mashed depressions are formed



at spaced locations along the ribs to facilitate bending of the latter when the metal strip is bent to form the panels of the drawer.

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**3,744,870**

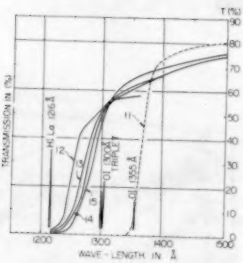
**OPTICAL FILTER COMPRISING A SUBSTRATE OF METAL FLUORIDE HAVING DEPOSITED THEREON A FILM OF STRONTIUM OR BARIUM FLUORIDE**

**Tetsuhiko Tomiki, and Takeo Miyata, both of Kadoma, Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan**

**Continuation-in-part of Ser. No. 852,738, Aug. 25, 1969, abandoned. This application May 28, 1971, Ser. No. 147,820**

**Int. Cl. G02b** *5/22*

**U.S. Cl. 350—1** **3 Claims**



An optical filter for selectively transmitting the ultraviolet rays of a predetermined spectral range including 1,300 A. triplet of atomic oxygen, which filter comprises an about 2 mm thick substrate composed of a metal fluoride, such as $CaF_2$, LiF or $MgF_2$ and a thin film having a thickness of 420 to 1,000 A. deposited thereon and composed of $SrF_2$ or $BaF_2$. By fabricating the thin film in such extremely thin lamina form, it is possible to completely isolate the ultraviolet rays of the predetermined range from the Lyman alpha radiation of atomic hydrogen even when the filter is subject to relatively large changes in the ambient temperature.

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**3,744,871**

**HOLOGRAPHIC MEMORY SYSTEM FOR RECORDING DIGITAL INFORMATION**

**Yasutsugu Takeda, Kokubunji, and Yoshitada Oshida, Nerima-ku, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

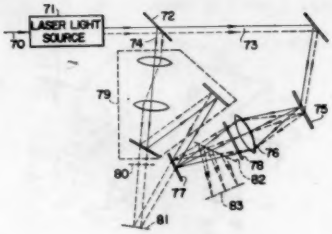
**Filed Feb. 25, 1971, Ser. No. 118,617**

**Claims priority, application Japan, Feb. 25, 1970, 45/15558; Dec. 25, 1970, 45/130688**

**Int. Cl. G02b** *27/00*

**U.S. Cl. 350—3.5** **1 Claim**

A memory system wherein information is represented as Fourier transforms, which are in turn recorded on a recording medium such as a photographic film with a high packing density by a holographic process. Coherent light from a laser is introduced to a light modulator, which inlcudes a bit array representing the information. The phase of the light wave corresponding to each bit is shifted at random so as to smooth




sharp variations in the light intensity distribution on the recording medium due to the interference between light waves diffracted by different bits. The abovementioned phase shift is performed either by using a random phase shifter or by using a random phase illumination hologram.

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**3,744,872**

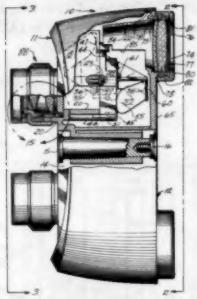
**BINOCULAR WITH IMPROVED PRISM MOUNT**

**Alfred A. Akin, Jr., West Covina, and David P. Bushnell, Altadena, both of Calif., assignors to Bushnell Optical Corporation, Pasadena, Calif.**

**Continuation-in-part of Ser. No. 70,686, Sept. 9, 1970, abandoned. This application May 28, 1971, Ser. No. 148,032**

**Int. Cl. G02b** *21/20, 7/18*

**U.S. Cl. 350—36** **6 Claims**



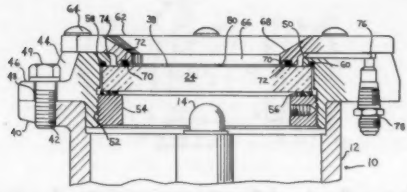
A prism binocular with molded hollow body housings each having a preformed shelf or seat to receive a first prism in optical alignment behind an objective lens. The prism is clamped in place by a block which carries a second prism positioned ahead of an ocular lens. The block is secured to the housing interior, and is movable to provide a coarse collimation adjustment during assembly of the binocular. A cover panel is fitted over the front of the housing and includes an integrally formed light shield extending toward the first prism. The ocular lens has a rapid-focus adjustment, and fine collimation is provided by adjustment screws which hold the objective lens in a mounting tube on the cover panel.

3,744,873

## APPARATUS FOR MAINTAINING DETECTING DEVICES FREE OF CONTAMINANTS

Will B. Jamison, Bethel Park, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Jan. 3, 1972, Ser. No. 214,570
Int. Cl. G02b 7/00
U.S. Cl. 350—63 2 Claims



A method and apparatus for maintaining the entry or lens of a detecting device, such as a flame detector, free of contaminants that might inhibit the passage of radiation into the detector by maintaining a substantially continuous flow of fluid over the detector lens.

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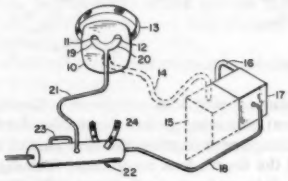
3,744,874

## FIRE FIGHTING APPARATUS

Denis L. McCarthy, 3008 Avenue M, Brooklyn, N.Y., and Joesph D'Albert, 10 Patricia Road, Patchogue, N.Y.

Filed Oct. 8, 1970, Ser. No. 79,082
Int. Cl. G02b 5/16
U.S. Cl. 350—96 B 3 Claims



Fire fighting apparatus, to enable fire fighters to see through smoke, includes a mask or goggles which fit over the eyes. The goggles are optically connected, preferably by fiber-optics, to a laser device. The laser device includes a laser, an electronic circuit to pulse the laser at a high frequency, and a beam splitting optical mechanism which couples the laser beam to the fiber-optical bundle.

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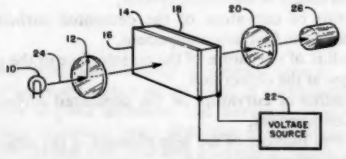
3,744,875

## FERROELECTRIC ELECTROOPTIC DEVICES

Gene H. Haertling, and Carroll B. McCampbell, Jr., both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Dec. 1, 1971, Ser. No. 203,701
Int. Cl. G02b 27/28; G02f 1/20
U.S. Cl. 350—150 5 Claims




An optical quality, slim-loop type, electrically induced ferroelectric ceramic plate made of essentially cubic phase, normally optically isotropic lead zirconate-lead titanate solid solution, an optically transparent, electrically conductive electrode disposed on each of the plate surfaces at locations in alignment through said plate, means for applying an electric field to the plate between the aligned electrodes to change said plate from the normal cubic phase to an induced ferroelectric phase and from the normal optically isotropic condition to an electrically induced anisotropic and birefringent condition, and means for sensing the change in optical condition.

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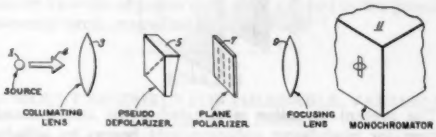
3,744,876

## OPTICAL DEVICE FOR TRANSFORMATION OF POLARIZATION

Richard B. Kay, 1807 Midlothion Court, Vienna, Va., and Richard J. Holland, 2231 Hall Place, N.W., Washington, D.C.

Filed July 2, 1971, Ser. No. 159,373
Int. Cl. G02b 27/28
U.S. Cl. 350—157 6 Claims




Passive optical apparatus which produces a plane polarized transmitted beam, proportional in intensity to the incident beam, and independent of the polarization of the incident beam is disclosed. The transmitted beam is always attenuated by a factor of one-half, and the apparatus works equally well with monochromatic or white light. The apparatus which includes a pseudo depolarizer followed by a plane polarizer is particularly suited for utilization with polarization sensitive instruments such as monochromators and spectrometers.

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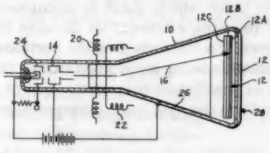
3,744,877

## DARK TRACE DISPLAY DEVICE EMPLOYING UV PHOSPHOR PLUS PHOTOCHROMIC RESIN INSIDE THE DISPLAY SCREEN WHICH GENERATES COLOR BY MEANS OF TRIPLET-TO-TRIPLET ABSORPTION

Robert Franz Stamm, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 24, 1971, Ser. No. 156,268
Int. Cl. G02f 1/36
U.S. Cl. 350—160 P 6 Claims



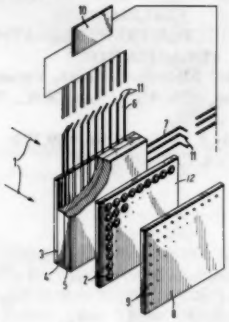
An information display screen viewable in high ambient light and darkness using a photochromic material capable of forming a dark trace and a luminescent trace. The photochromic material is molecularly dispensed in a rigid, transparent matrix. The photochromic materials used are polynuclear aromatic hydrocarbons and nitrogen containing heterocyclic compounds.

3,744,878

## LIQUID CRYSTAL MATRIX WITH CONTRAST ENHANCEMENT

Horst Kiemle, and Ulrich Wolff, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 14, 1971, Ser. No. 180,407
Claims priority, application Germany, Sept. 28, 1970, P 20 47 651.1
Int. Cl. G02f 1/28
U.S. Cl. 350—160 LC 11 Claims



The present invention is directed to an arrangement or system for modulating coherent light beams by utilizing a liquid crystal matrix having a plurality of coacting electrode pairs to apply an electrical field to change the light transmitting state of the portion of the liquid crystal associated with each electrode pair from a non-scattering state to a scattering state. To separate the scattered light from non-scattered light and obtain the intensity modulation, a filtering means for removing the scattered radiation is provided for each of the electrode pairs of the matrix and comprises a focusing element having a mask or partition with a window or aperture which partition is disposed at the focal plane of the element with the window or aperture at the focal point to enable the passing of the focused non-scattered light rays with the filtering of the scattered rays. Preferably, the electrode pairs are provided by forming parallel strips of electrically conductive material on the plates of the matrix with the strips of one plate being arranged at 90° to the strips the other matrix so that a coacting electrode pair is provided at each point at which two strips cross or overlap. The focusing elements can be lenses such as cylindrical lenses, fresnel zone plates or concave mirrors. The windows in the partition can be either substantially circular aperatures such as perforations through either a sheet or foil or slit-like apertures. The focusing elements or lenses are preferably formed in one of the plates of the liquid crystal matrix such as by pressing or embossing. A preferred method of forming the partition for the arrangement is to project light through the focusing elements, such as those embossed into a carrier plate of the matrix, onto a sheet of material having a photosensitive layer which sheet is positioned at the focal plane of the focusing elements to develop the light transmitting windows. If a foil is used as the partition, the intensity of the light radiation being projected through the focusing elements can be of a sufficient magnitude to burn the aperatures into the foil to form the light transmitting windows.

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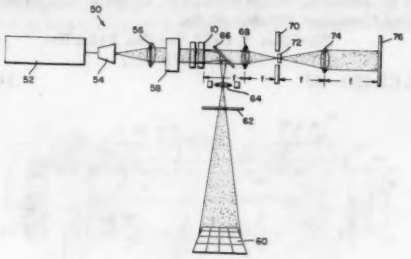
3,744,879

## LIQUID CRYSTAL OPTICAL PROCESSOR

Terry D. Beard, Woodland Hills, and William P. Bleha, Jr., Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 26, 1971, Ser. No. 192,406
Int. Cl. G02b 27/38; G06q 9/00
U.S. Cl. 350—162 SF 16 Claims

The optical processor employs a photoconductor-activated liquid crystal as a spatial filter to control transmissivity of coherent light through the processor. The liquid crystal filter pattern determines the pattern input to Fourier transform and



can optionally also define the transmissivity of a Fourier processing filter. This permits near real time transform.

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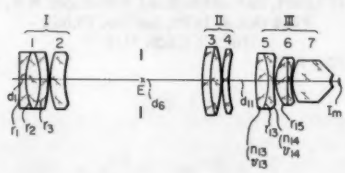
3,744,880

## PRECISION COPYING LENS

Koichi Yuta, No. 3-27-41, Hujoshicho, Kokubunji-shi, Tokyo, Japan

Filed Feb. 10, 1972, Ser. No. 225,247
Int. Cl. G02b 9/64
U.S. Cl. 350—214 5 Claims



The precision copying lens comprises a first to a seventh lens component beginning at the object side, the first and the second lens component forming the first part of the lens and the third and the fourth lens component forming the second part spaced a distance from the first part, while the fifth to the seventh lens component form the third part spaced a distance from the second part. The first lens component consists of three lens elements cemented to each other and the second lens component is in the form of meniscus arranged closely adjacent to the first lens component. At least one of the third and the fourth lens component consists of two lens elements cemented to each other. Each of the fifth and the sixth lens components consists of two lens elements cemented to each other, while the seventh lens component is in the form of a meniscus having a large width. The copying lens satisfies the following conditions:

$$0.8f < |r_3| < 1.2f$$

$$0.6f < r_{13} < 0.8f$$

$$1.0f < |r_{13}| < 1.5f$$

$$25 < |\nu_{14} - \nu_{13}|$$

where:

$f$ = focal length of the entire system,

$r_3$ = radius of curvature of the cemented surfaces at the image side in the first lens component,

$r_{13}$ = radius of curvature of the air interface of the sixth lens component at the object side,

$r_{13}$ = radius of curvature of the cemented surfaces in the fifth lens component,

$\nu_{13}$ = Abbe number of the lens element at the object side in the fifth lens component, and

$\nu_{14}$ = Abbe number of the lens element at the image side in the fifth lens component.

3,744,881

## MICROSCOPIC OBJECTIVE

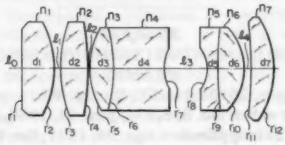
Akio Taira, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 3, 1971, Ser. No. 149,465

Claims priority, application Japan, June 26, 1970, 45/55191; June 26, 1970, 45/55192; June 26, 1970, 45/55193

Int. Cl. G02b 21/02

U.S. Cl. 350—218 3 Claims



The microscopic objective having a low magnification includes three lens groups separated from each other by an air gap. The foremost first group includes two cemented lens elements of the positive power as a whole, and the second group includes a negative lens component while the third group includes two cemented lens elements of the positive power as a whole. The objective satisfies the following limitations:

$$0.4f < l_2 < 1.2f \quad (1)$$

$$20 < |v_5 - v_6| < 50 \quad (2)$$

$$15 < |v_1 - v_2| \quad (3)$$

$$(0.1/f) < (n_1 - n_2/r_2) < (1/f) \quad (4)$$

where:

$n_1$, $n_2$ and $v_1$, $v_2$ = refractive index and the Abbe number, respectively, of the respective lens element in the first group beginning at the object side,

$r_2$ = radius of curvature of the cemented surfaces of the lens elements in the first group,

$v_5$, $v_6$ = Abbe number of the respective lens element in the third group beginning at the objective side,

$l_2$ = air gap between the second group and the third group, and

$f$ = focal length of the entire system.

The objective provides a short working distance while various aberrations are well compensated for and the image surface is made flat.

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3,744,882

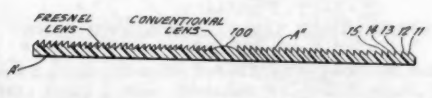
## COMPOSITE LENS FOR AN OPTICAL COMMUNICATION SYSTEM PROVIDING DIRECTLY VIEWED REAL IMAGES

Harry D. Forster, Jr., Miami, Fla., assignor to Holograph Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 884,786, Dec. 15, 1969, abandoned. This application Aug. 20, 1971, Ser. No. 173,369

Int. Cl. G02b 3/08, 27/02

U.S. Cl. 350—241 16 Claims




A Fresnel type lens having a discontinuously sloping stepped surface surrounds a smaller lens of comparable focal length axially aligned therewith but having a continuously sloping surface to reduce image distortion in the vicinity of the center of the Fresnel lens. The lens provides a unique viewing capability in both single lens and composite lens structures.

3,744,883

## MAGNIFYING ATTACHMENT FOR TWEEZERS

Wilfred A. Williams, 708 9th St., Modesto, Calif.

Filed Oct. 19, 1971, Ser. No. 190,620

Int. Cl. B25b 9/02; A61b 17/50

U.S. Cl. 350—244 4 Claims

Tweezers having a head from which the tweezers' arms extend. The head defines an opening and provides a support for a magnifying lens covering said opening, and which enables the user to view the object or part, to be gripped by the jaws of the tweezers' arms, magnified or enlarged.

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3,744,884

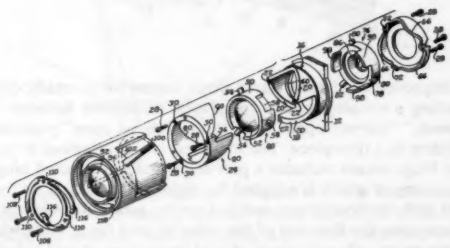
## LENS MOUNT ASSEMBLY FOR FOCUSABLE, VARIABLE FOCAL LENGTH LENS

Danny Filipovich, Chicago, Ill.; Richard K. Carlson, Tokyo, Japan, and Theodore M. Hadzimahalis, Libertyville, Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 2, 1971, Ser. No. 194,984

Int. Cl. G02b 7/02

U.S. Cl. 350—255 7 Claims



A lens mount assembly for the variable magnification afocal or zoom unit of an objective lens for a camera including first and second barrel portions cooperating to define cam tracks by which optical components are simultaneously and differentially adjusted axially upon rotational adjustment of an external sleeve which further carries a focusing element adjusted by axial movement of the sleeve. Further, a method of fabrication of the lens mount assembly is described.

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3,744,885

## ANGULAR VIEWING DEVICE

Alec Hurtado, 10865 E. Conejo, and Eugene A. Fontes, 2655 6th Avenue, both of Kingsburg, Calif.

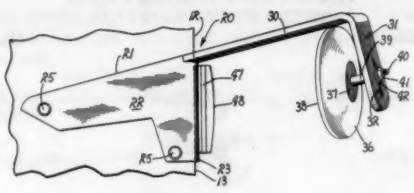
Filed Nov. 22, 1971, Ser. No. 200,696

Int. Cl. G02b 5/08

U.S. Cl. 350—307 2 Claims

An angular viewing device, for viewing an obscured area adjacent to a vehicle having a side view mirror, the viewing device having a bracket mounted on the vehicle in a predetermined position relative to the area to be viewed and in relation to the side view mirror; a support extended from the bracket; a first mirror mounted on the support in spaced relation from

the bracket and in diagonally reflective alignment with the side view mirror; and a second mirror, having a convex reflective surface, mounted on the bracket in reflective alignment with the first mirror and the obscured area.



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**3,744,886**

**HINGE CONSTRUCTION FOR SPECTACLES FRAMES**

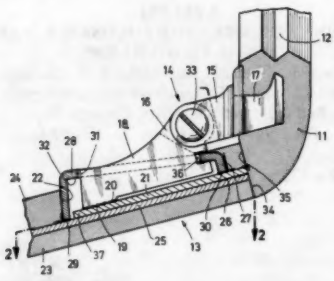
**Otto Filitz, Ruhpolding, Germany, assignor to Otto Filitz & Co. Fabrik Optischer, Muhlacker, Germany**

**Filed Dec. 16, 1971, Ser. No. 208,859**

**Claims priority, application Germany, Dec. 23, 1970, P 20 63 426.8**

**Int. Cl. G02c** *5/16, 5/22;* **E05d** *5/00*

**U.S. Cl. 351—113** **5 Claims**



Improved spectacles frame hinge means for pivotally connecting a temple member for pivotal movement between "closed," "normal open" and "overextended open" positions relative to a frontpiece. The invention is characterized in that the hinge means includes a pair of pivotally connected hinge arms one of which is adapted for rigid connection at its free end with the frontpiece, and leaf spring means for resiliently connecting the free end of the other of said hinge arms with said temple, whereby upon pivotal movement of said temple beyond said "normally open" position toward said "overextended open" position, said leaf spring means flexes to permit movement of said second hinge arm relative to said temple.

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**3,744,887**

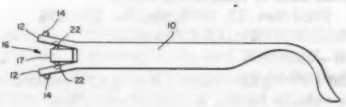
**PLASTIC HINGE FOR SPECTACLES**

**George Dunbar, Sinking Spring, Pa., assignor to ESB Incorporated, Philadelphia, Pa.**

**Filed June 22, 1972, Ser. No. 265,158**

**Int. Cl. G02c** *5/22, 5/16*

**U.S. Cl. 351—153** **8 Claims**



A hinge for use with molded plastic parts and, in particular, for spectacles comprises two parallel bosses with sockets therein forming a part of the spectacle frame. A temple body has two pin arms formed thereon each pin arm including a projecting pin. A slot separates the two pin arms and permits assembly of the hinge. A pin arm locking bar is formed as a part of the temple body and is attached thereto by a web thin enough to be flexible. Cooperating locking means are formed on the locking bar and the pin arms. When the projecting pins are located in the sockets in the bosses and pin arm locking bar is forced between the pin arms, a simple permanent hinge is formed.

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**3,744,888**

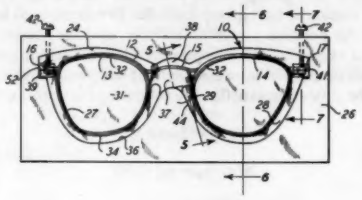
**METHOD OF MAKING CUSHIONED SPECTACLE FRAMES**

**Frank S. Bogyos, 2510 Lawn St., Racine, Wis.**

**Division of Ser. No. 835,996, June 24, 1969, Pat. No. 3,582,193. This application Apr. 26, 1971, Ser. No. 137,622**

**Int. Cl. G02c** *13/00;* **B29d** *13/00*

**U.S. Cl. 351—178** **3 Claims**



Athletic eye spectacles having a frame including a lens-holding piece and temples. The frame includes a covering of a coating material which is soft and resilient, while the frame has an inner core of a harder material for properly supporting the lenses. The coating material is sufficiently resilient or soft so that if the spectacles are hit, the wearer will not be injured, nor will the person who strikes the spectacles. The spectacles are made by placing the inner or base frame in a mold, and the coating material is poured into the mold in liquid form and is permitted to set around the base frame. Finally, the temple pieces are also coated and affixed to the lens-holding frame piece.

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**3,744,889**

**MOTION PICTURE PROJECTOR FOR USE WITH PLURAL TYPES OF FILM-CONTAINING MAGAZINE**

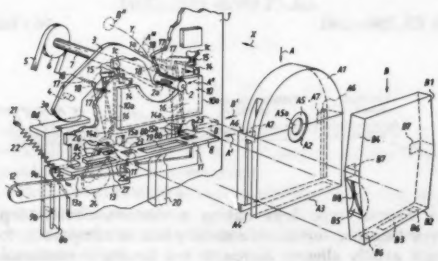
**Herbert Wilsch, and Johann Zanner, Jr., both of Unterhaching, Germany**

**Filed Feb. 23, 1972, Ser. No. 228,656**

**Claims priority, application Germany, Feb. 27, 1971, P 21 09 465.5**

**Int. Cl. G03b** *23/02*

**U.S. Cl. 352—72** **13 Claims**



The housing of a motion picture projector has a platform which is movable between first and second positions to

thereby respectively support from below magazines of a first type with floating reels and magazines of a second type with centered reels. The housing further supports a spindle which is movable to a first position to thereby center the reel of a magazine of the first type in the operative position of such magazine, and to a second position in which it is out of the way of a magazine of the second type when such magazine dwells in its operative position. The housing also supports stationary and movable engaging elements which can engage complementary elements on the magazines to locate and/or hold such magazines in their operative positions. A displacing lever can move the platform and the spindle, as well as the movable enegaging elements, so that the engaging elements for magazines of the second type are out of the way when the platform can support a magazine of the first type, and vice versa. The displacing lever can also move a friction wheel which serves to rotate the reels in magazines of the second type.

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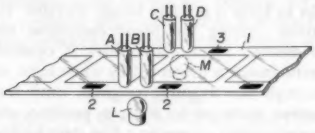
**3,744,890**

## SYSTEM FOR SEARCHING FOR DESIRED INFORMATION

**Koichi Suzuki, Kanagawa, and Hajime Yamashita, Tokyo, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Oct. 9, 1970, Ser. No. 79,373**
**Int. Cl. G03b *23/12***
**U.S. Cl. 353—26** **9 Claims**




A system for searching for desired recorded information, such as records on relatively long lengths of microfilm, is effective both to select a group of frames containing the desired information and to select the particular frame or frames within the group containing the desired information. The microfilm is provided, along one marginal edge, with an identification mark correlated with each frame and having a transparency different from that of the remainder of the film margin, and the microfilm is further provided with additional identification marks along the opposite margin of the microfilm, of the same type as those along the first mentioned margin, and each related to a group of frames. Respective photoelectric transducer means scan both sets of identification marks and provide output pulses which are supplied to a counting circuit. When the film is moving in an arbitrary forward direction, the output pulses are counted and compared with a preset number set in a register. When the microfilm is moving in the opposite direction, the pulses are subtracted and compared with the preset number in the register. The register is connected to a comparator which is also connected to the pulse counter, and the comparator controls a means for moving the microfilm in either the forward direction or the reverse direction.

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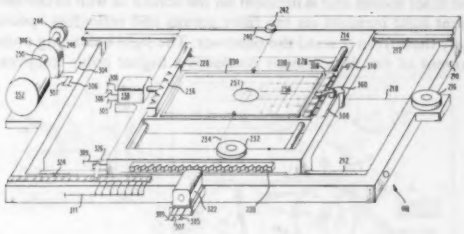
**3,744,891**

## TWO-DIMENSION REPEATABLE, POSITIONABLE TABLE

**Ralph E. Dennis, Rockville; Robert C. Green, Bethesda, both of Md.; James J. Honn, Manassas, Va., and James H. Nottingham, Gaithersburg, Md., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 25, 1970, Ser. No. 92,787**
**Int. Cl. G03b *23/08*; B43l *5/00***
**U.S. Cl. 353—27** **7 Claims**

An X-Y table capable of repeatably being positioned accurately in predetermined coordinate positions. The table is driven by a single electric motor for a power source which positions the table in both coordinates, either simultaneously or sequentially, and is accurately positioned by elec-



tromechanical solenoids for locking the table into predefined positions, thereby providing repeatability and reliability of positioning of the material carried by the table.

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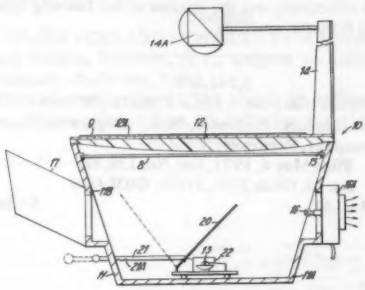
**3,744,892**

## OPTICAL PROJECTION DEVICE

**Raymond Henry Shipsey, Glasgow, England, assignor to Charles Frank Limited**

**Filed Apr. 8, 1971, Ser. No. 132,477**
**Claims priority, application Great Britain, Apr. 15, 1970, 17,850/70**
**Int. Cl. G03b *21/08***
**U.S. Cl. 353—63** **3 Claims**




An optical projector which combines the dual functions of episcope and overhead projector is described. The projector comprises a single casing housing a pivotally mounted mirrored member movable between two positions in one of which it permits light from a source to traverse a Fresnel lens and a transparent carrier thereon to an overhead lens system forming part of the overhead projector. In its other position the mirrored member permits reflection of image-forming light reflected from an opaque carrier to be directed through a projection lens forming part of the episcope. The material to be projected is supported by a single surface of the casing and the operative modes are alternative.

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**3,744,893**

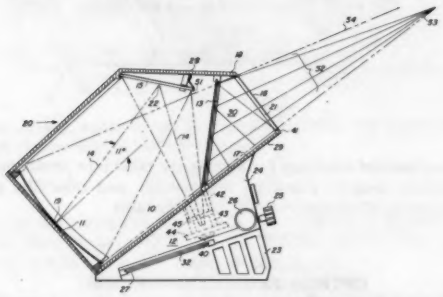
## VIEWING DEVICE WITH FILTER MEANS FOR OPTIMIZING IMAGE QUALITY

**Jasper S. Chandler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 19, 1971, Ser. No. 126,215**
**Int. Cl. G03b *21/22, 21/14***
**U.S. Cl. 353—75** **11 Claims**

A device for viewing an image projected onto a front surface screen comprises a housing provided with a viewing opening and within which said screen is mounted. Filter means is arranged within the housing between the screen and the viewing opening so as to optimize the luminance of the image reflected by the screen when viewed by an observer through

the viewing opening. The filter means in conjunction with a housing shroud which surrounds the viewing opening serve to reduce substantially the ambient light which passes through the filter means and is incident on the screen as well as the ambient light incident on the filter means and reflecting specularly therefrom toward the observer. The light balancing component of the filter means produces a higher color temperature than is possible with commercially available incandescent light sources even though it is operated at less than its rated voltage. The filter means can also include a neutral density component for improving the image brightness and contrast due to the reduced effect of ambient light. The filter means is also used to effectively seal the interior of the housing against dust and dirt from the environs.



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**3,744,894**

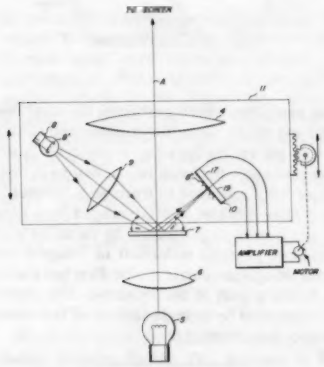
**SERVO AMPLIFIER FOR A SELF-POSITIONING SYSTEM**

**Harvey Orlo Hoadley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 4, 1971, Ser. No. 139,328**

**Int. Cl. G03b** *3/00, 21/14*; **G03f** *1/08*

**U.S. Cl. 353—101** **9 Claims**




A servo amplifier for use with a DC motor and an AC power source. The motor is driven in a direction and by an amount determined by the polarity and amplitude, respectively, of an input half-wave rectified current which is controlled by a bridge at the input of the amplifier. The direction and degree of unbalance in the bridge determine the polarity and amplitude of the current. Such bridge unbalance can be used, for example, to indicate the amount and direction a projector is out of focus. By incorporating this circuit in a projector, correct focus can be automatically retained as slides or frames are sequenced. The "dead zone," i.e., the amount of input signal variance allowed before current flows turning the motor is reduced in existing automatic focusing systems when the invention is incorporated therein.

**3,744,895**

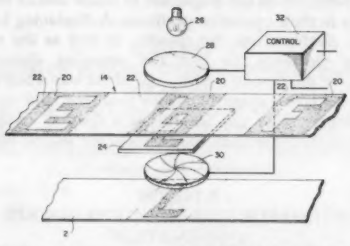
**APPARATUS FOR FORMING IMAGES**

**George K. Czarnikow, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 874,768, Nov. 7, 1969, abandoned. This application Sept. 16, 1971, Ser. No. 181,260**

**Int. Cl. G03g** *15/14*

**U.S. Cl. 355—3** **3 Claims**




A method and apparatus is provided for making positive electrostatic images on charged photoconductive material, such as zinc oxide, from negative originals without employing reverse development techniques. A layer of normally transparent photochromatic material is interposed between a negative original and the photoconductive material. The photochromatic material is exposed to the image by ultraviolet light to form a positive image thereon. This light is prevented from striking the photoconductive material by means of a shutter. Next, the shutter is opened and the photochromatic image is projected by white light, which does not pass through the negative original, onto the charged photoconductive material to form a positive electrostatic image. The original may comprise a film strip having negative image areas interspaced between transparent areas so that the filmstrip may be moved to initially position a negative image area for imagewise exposure of the photochromatic material to ultraviolet light and then moved to another position to expose the charged photoconductive material to the positive image on the photochromatic material by white light projected through a transparent area.

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**3,744,896**

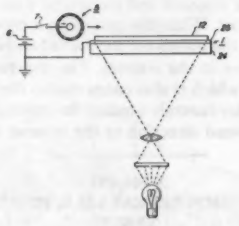
**IMAGING SYSTEM**

**Leonard M. Carreira, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**

**Division of Ser. No. 690,579, Dec. 14, 1967. This application Sept. 25, 1970, Ser. No. 75,386**

**Int. Cl. G03g** *15/00, 15/10*

**U.S. Cl. 355—3** **2 Claims**



An electrophoretic imaging system utilizing a pair of electrodes and a suspension of electrically photosensitive particles in an insulating carrier liquid is described in which at least one of the electrodes is porous and contains the suspension in the pores. In one embodiment, the electrodes are spaced adjacent each other and the suspension is fed through the porous electrode into the inter-electrode space during photoelectrophoretic image formation.

**3,744,897**

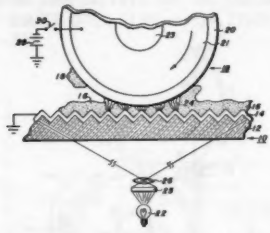
## TRANSPARENT ELECTRODE FOR ELECTROPHORETIC IMAGING

**Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**

**Division of Ser. No. 821,369, May 2, 1969, Pat. No. 3,630,884. This application May 26, 1971, Ser. No. 147,179**

**Int. Cl. G03g** *15/22*

**U.S. Cl. 355—3** **9 Claims**



Apparatus for improved imaging and for eliminating corona arcing in an electrophoretic imaging system employing a transparent electrode having electrically conductive transparent portions causing variations in the surface potential of the electrode under the influence of an electrical field. The electrode functions within an imaging system also having a means to illuminate the conductive portions for forming an image in a confined electrical field in a manner preventing corona arcing between electrodes of the imaging system.

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**3,744,898**

## CORONA DISCHARGE APPARATUS

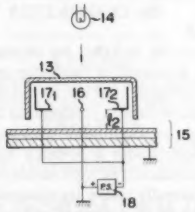
**Akira Kurahashi; Masayoshi Ishihara, and Giichi Marushima, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 777,215, Nov. 20, 1968, Pat. No. 3,624,392. This application Sept. 23, 1971, Ser. No. 183,112**

**Claims priority, application Japan, Nov. 28, 1967, 42/76631; Dec. 18, 1967, 42/81053; Apr. 1, 1968, 43/21307**

**Int. Cl. G03g** *15/00*

**U.S. Cl. 355—3** **11 Claims**



Apparatus is disclosed for simultaneously exposing a photosensitive member to image radiation and imparting charge to the photosensitive member. A plurality of needle electrodes is positioned intermediate the photosensitive member and a conductive member. An image radiation generator is positioned adjacent a translucent expanse of the conductive member.

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**3,744,899**

## METHOD OF PREPARING DOCUMENTS

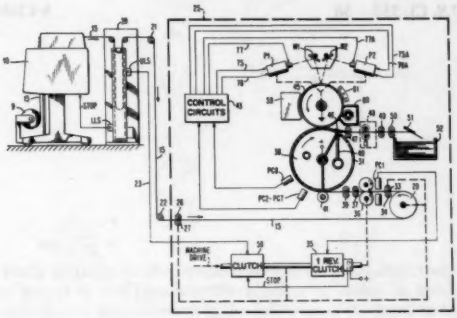
**Arthur J. Sable, Riverside, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 758,158, Sept. 6, 1068, Pat. No. 3,576,367. This application June 11, 1970, Ser. No. 57,376**

**Int. Cl. G03b** *27/52*; **G03g** *5/00*

**U.S. Cl. 355—14** **3 Claims**

A method of printing variable data in which a succession of documents are prepared by first printing the variable data along with control symbols manifestive of the document format of fixed data, and then reading the symbols to select the appropriate background data instrumentality and overprinting



the appropriate forms background over the variable data in a second step employing the selected background data instrumentality, preferably by means of xerographic electrophotography.

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**3,744,900**

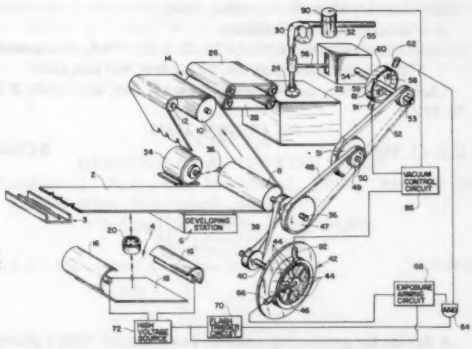
## PAPER FEED AND EXPOSURE SYNCHRONIZER

**Jorgen Reesen, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 23,705, March 30, 1970, abandoned. This application Sept. 27, 1971, Ser. No. 184,227**

**Int. Cl. G03b** *27/00*

**U.S. Cl. 355—16** **8 Claims**



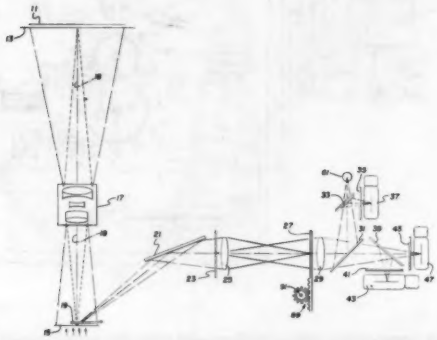
A synchronizer for an electrophotographic device is provided wherein an electronic flash exposure is initiated in response to the position of a movable photosensitive surface to be exposed and the position of a paper feed device for feeding receiver sheets onto which a toned image is to be placed. The paper feed device operates cyclically during movement of the photosensitive surface but is enabled to feed paper only in response to the proper position of an image on the photosensitive surface and is disabled in response to position of the paper feed device itself. This invention is particularly applicable in an electrophotographic device in which an endless photoconductive web is used to form a toner image which image is transferred in proper time relation to a receiver sheet fed by the paper feeding device.

3,744,901

## PHOTOGRAPHIC SPOT MONITOR APPARATUS

James E. Harter, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1971, Ser. No. 187,481
Int. Cl. G03b 27/78
U.S. Cl. 355—38 6 Claims



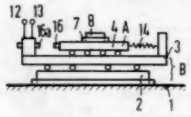
Photographic spot monitor apparatus includes a plurality of spot rings adapted to be selectively positioned in the near focal plane of a film transparency to thereby project the image of the ring onto the print plane defining the area being monitored. The monitoring apparatus positioned adjacent the optical axis of the printer, intercepts oblique light emanating through the spot ring from the film transparency and divides the light so intercepted into its basic color components to facilitate analysis of the color content of the transparency. The monitoring apparatus also includes a plurality of stops corresponding to said plurality of spot rings, each of said stops being selected for use with its corresponding ring.

3,744,902

## DEVICE FOR PRODUCING A PHOTO-VARNISH MASK

Heinz Henker, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 769,856, Oct. 23, 1968, abandoned. This application July 14, 1971, Ser. No. 162,685
Claims priority, application Germany, Oct. 23, 1968, P 11 26 212.1
Int. Cl. G03b 27/42
U.S. Cl. 355—53 8 Claims



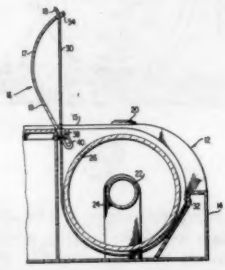

A device for producing a photo-varnish mask with a plurality of equal, mutually displaced structures, where a photo-varnish layer, attached to a plate or disc-shaped carrier, is gradually locally illuminated by projection at individual discrete places, for the purpose of producing one structure, and following all illuminating processes is developed and processed into a photo-varnish mask. A table provided with a defined attachment for the carrier of the photo-varnish layer is mechanically coupled with a second table and displaceable upon the latter in two coordinate directions. Mechanical gears are provided to adjust the position of the second table with respect to the stationary surrounding or reference plane. A gearless fine adjustment is provided between the first table and the second table which works continuously to adjust the position of the first table with respect to the second table. A mark, which is stationary at least with respect to both tables, is provided to aid in adjusting the exact position of the first table in the horizontal plane, by optical interferences, and particularly laser interferences.

3,744,903

## CONTACT PHOTOCOPY APPARATUS

Solomon Frost, Barr Road, Berwyn, Pa.

Filed June 14, 1971, Ser. No. 152,882
Int. Cl. G03b 27/22
U.S. Cl. 355—117 8 Claims



A photocopy machine of the contact type has a transparent cylinder incorporated within a housing to be exposed when a cover is raised for insertion and removal of paper. A flexible sheet is secured to a front portion of the housing, the sheet extending beneath the cylinder and encircling the cylinder. The other end of the flexible sheet is secured to the free or distal end of the cover. A pivotable and slidable mounting of the cover on the housing permits the cover to draw the film tightly around the cylinder when the cover is closed and permits the sheet to loosely conform to the bottom of the cylinder when the cover is opened for easy insertion and removal of original and copy papers between the flexible sheet and the cylinder.

3,744,904

## TRANSPARENT PHOTOGRAPHIC MASKS

Frank J. Loprest, and Donald E. Barr, both of Binghamton, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed June 11, 1970, Ser. No. 45,590
Int. Cl. G03b 27/28
U.S. Cl. 355—125 9 Claims

Photographic masks, suitable for reproduction in a photo-resist layer — by exposure of the latter to actinic light under the mask, and development of the photo-resist image — of the pattern of a microelectronic component or device, are made by exposure to light in accordance with an original (especially by contact exposure under a primary mask) containing the pattern to be reproduced, of light-sensitive material having a flat, rigid, dimensionally stable transparent base such as glass and a thin (e. g. 0.5 to 10 micron thick) transparent resin layer adhering to the base and containing, molecularly dispersed therein an azo coupling component and a light-sensitive diazonium compound, susceptible to decomposition on exposure to light and temporarily stabilized against coupling pending alkaline development, the diazonium compound and coupling component being uniformly distributed throughout the thickness of the resin layer, said light-sensitive material yielding on development with ammonia vapor, in the unexposed areas, an azo dye coloration transparent to visible light but opaque to ultraviolet light, while the decomposition products of the diazonium compound and azo coupling component in the light-exposed areas are transparent to ultraviolet as well as visible light. The light-sensitive materials are made by applying the sensitizing composition and resin to the base in the form of a solution in a volatile solvent, removing any excess e. g., by centrifugation, and drying to remove the solvent. The masks produced afford satisfactory resolution to 0.1 micron. They are used to reproduce the pattern in a photo-resist layer coated on a substrate such as a silicon wafer, as by

contact exposure under the mask, development of the photo-resist, and suitable modifying treatment of the thereby exposed areas of the underlying substrate.

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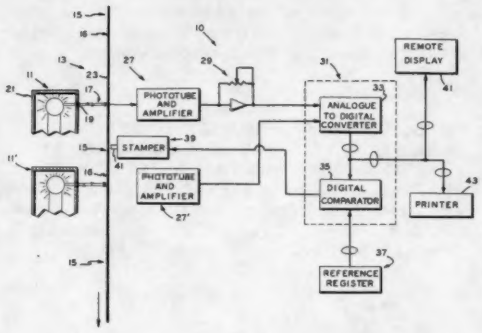
**3,744,905**

## APPARATUS FOR MEASURING AND MARKING APERTURE MASKS

**Charles W. Smith, Ulster, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.**

**Filed June 24, 1971, Ser. No. 156,388**
**Int. Cl. G01b** *11/00, 11/04, 11/24*
**U.S. Cl. 356—156** **12 Claims**




An apparatus for measuring and marking aperture masks for color television cathode ray tubes according to hole size utilizing a light source positioned on one side of the mask and a light detection means positioned on the other side. Upon receiving the portion of light which passes through the mask, the light detection means converts the light to a first electrical signal and sends this signal to a comparing means, which simultaneously receives a second signal representative of the proper hole size designated for the mask from a selection means. Should the two signals compare favorably, a control signal is derived which actuates a marking means for consequently marking the measured mask. Should the two signals not compare, the measured mask is not marked and is therefore rejected.

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**3,744,906**

## DEVICE FOR DETERMINING THE DISTANCE OF AN OBJECT FROM AN ENDOSCOPE AND DEVICE THEREFOR

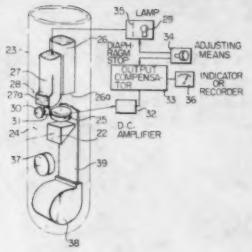
**Masaaki Sato, Shoichi Saito, and Shinya Kosaka, all of Tokyo, Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan**

**Division of Ser. No. 747,224, July 24, 1968, Pat. No. 3,608,547. This application Apr. 6, 1970, Ser. No. 31,060**
**Claims priority, application Japan, July 29, 1967, 42/48686; Dec. 19, 1967, 42/81328**
**Int. Cl. G01c** *3/08*
**U.S. Cl. 356—4** **10 Claims**

Method for determining the distance of an object from an endoscope which comprises the steps of emitting a light of predetermined intensity and receiving the light reflected from the object having substantially the same reflecting power over the entire area thereof by a photoelectric element, the intensity of the reflected light being the function of the distance from the object, the photo-electric element produces an electrical signal corresponding to the distance. The signal thus produced is recorded and compared with a previously prepared chart indicating the relation between the signal and the distance so that the distance is determined after the operation of the endoscope is completed.

The spectroscopic characteristics of the light used for determining the distance is so selected that the film contained in the endoscope for photographing the object is not affected by the light used for determining the distance so that the determination of the distance can be made during the operation of the endoscope.

The intensity of the light used for determining the distance




is made variable for the better observation of the object while the output of the photoelectric element is varied in inverse proportion to the variation in the intensity of the light so that the correct determination of the distance can be made even though the intensity of the light source is varied.

The devices for carrying out each of the above method.

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**3,744,907**

## LIQUID TESTER

**Paul L. Whelan, P.O. Box 529, Dallas, Tex.**

**Filed Feb. 4, 1972, Ser. No. 223,619**
**Int. Cl. G01n** *33/28, 1/10*
**U.S. Cl. 356—70** **4 Claims**

An article for receiving a small sample of liquid and holding the sample in a chamber of predetermined shape so that indicia on the bottom of said chamber can be viewed through the liquid and thereby used to accurately determine the level of contamination of the sample.

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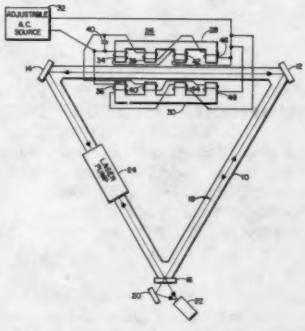
**3,744,908**

## EXTERNALLY BIASED RING LASER

**Theodore J. Podgorski, Maplewood, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Dec. 16, 1968, Ser. No. 784,086**
**Int. Cl. G01b** *9/02*
**U.S. Cl. 356—106 RL** **7 Claims**




Apparatus to bias a laser gyroscope in which a linear induction motor is positioned adjacent to one leg of the laser

gyroscope so as to generate a moving magnetic field in the laser plasma. Such a field moves or pumps the plasma gas so as to present an apparent change in the index of refraction of the gas and an apparent change in path length to the two oppositely traveling beams.

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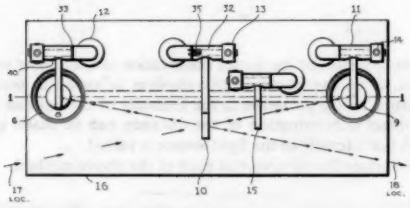
**3,744,909**
**GRAVITY INTERFEROMETER SYSTEM**

**Marshall H. Bruce, P.O. Box 331, Bedford, Mass.**

**Filed Mar. 26, 1970, Ser. No. 22,872**
**Int. Cl. G01b 9/02**
**U.S. Cl. 356—106** **2 Claims**



A new type of gravity interferometer using an equilibrium fluid medium for its characteristic optical flatness is described. The technique consists of using the fluid surface to act as the sensing element for monitoring the direction of force gradients, since a sufficiently static and isolated fluid element does not exhibit any shear. One common example of this is the flat surface which a basin like container or fluid assumes when it is placed upon the earth. Such a surface is perpendicular to the vertical, that is, at right angles to the gradient of the earth's gravitational potential field. The new system includes a modification of the well known Michelson Interferometer. When complete and in operation the instrument indicates, over time, the very minute tilt angles of the earth's land mass in terms of a visible and measurable fringe pattern shift. These small land mass tilt angles, in turn, substantiate the predication of the tidal effects on the earth's land mass that are caused, primarily, by both solar and lunar gravitational attraction. The new instrument possesses a high degree of resolution. Matters related to mechanical and thermal considerations are discussed. Also, information is presented for an optional method of electronically monitoring and recording the instruments data, as signal output. Local noise is well dampened by the use of the fluid medium. The geophysical theory involved is developed and summarized. The latter agrees with the empirical, or with the results obtained from continuous operation of the new gravity interferometer system.

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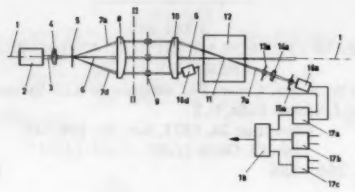
**3,744,910**
**APPARATUS FOR OPTICAL INVESTIGATIONS AND MEASUREMENTS WITH THE AID OF SEVERAL COHERENT LIGHT BEAMS**

**Wim van Deelen, Maassluis, Netherlands, assignor to Nederlandse Organisatie Voor Toegepastnatuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands**

**Filed June 11, 1971, Ser. No. 152,102**
**Int. Cl. G01b 9/02; G01c 3/08**
**U.S. Cl. 356—106** **4 Claims**

In an apparatus for optical investigations and measurements in which a laser and a beam splitter produce coherent beams of monochromatic light, the beam splitter is a hologram that is a photographic reproduction of the intersection of corresponding coherent beams of monochromatic light. The superposition of a plurality of such holograms in different positions results in a multiple beam splitter that provides a plurality of coherent beams. These beams are used for the three-dimensional determination of the speed of a moving effluvium and for the elimination of noise in the output signals.



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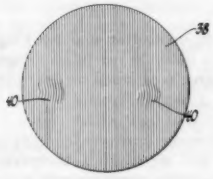
**3,744,911**
**HOLOGRAPHIC METHOD FOR INTERFEROMETRIC MEASUREMENT OF MATERIAL CORROSION AND EROSION ON ARBITRARY SURFACES**

**Karl A. Stetson, Richmond, England, and Ralph M. Grant, Ann Arbor, Mich., assignors to G C Optronics, Inc., Ann Arbor, Mich.**

**Filed June 11, 1970, Ser. No. 45,303**
**Int. Cl. G01b 9/02**
**U.S. Cl. 356—109** **7 Claims**



To measure the material removal or build up resulting from corrosion or erosion of an object, a hologram is formed by recording on a photographic media the interference pattern between coherent light divided between a uniform, reproducible wavefront, and mutually coherent light reflected from the object. The virtual image of the object as seen through the hologram formed by the developed photographic material, properly illuminated, is superimposed on the object and the object is inclined or rotated or both with respect to its original position, resulting in fringes which may be observed on the superimposed images of the object and the virtual image field. Corrosion or erosion of a section of the surface of the object can increase or decrease its average profile without altering the details of its structure so much as to destroy the visibility of the interference fringes. The result is that the fringes are shifted laterally by an amount that measures the change in average profile due to the corrosion or erosion.

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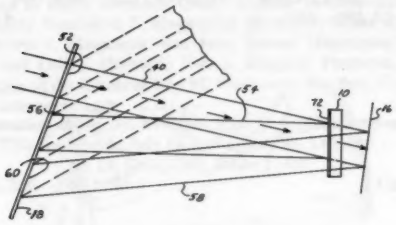
**3,744,912**
**HOLOGRAPHIC THIN FILM ANALYZER**

**John R. Williams, Huntsville, Ala., and Burnice N. Norden, Gaithersburg, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Aug. 30, 1971, Ser. No. 175,981**
**Int. Cl. G01b 9/02; G02b**
**U.S. Cl. 356—108** **4 Claims**

A system for the analysis and measurement of thin films in which the light output of a laser is split into two beams, a first beam being focused to illuminate the entire area of a photographic plate and a second beam being columnated and directed through a relatively small portion of the photographic plate onto the sample having a film to be observed. The sur-

face of the sample is positioned at a slight angle with respect to a plane normal to the second beam and the light reflected from the sample arrives back at the photographic plate in a region other than through which the second beam originally passed. By making two successive exposures during the



deposition of material on the surface of the sample, holograms are recorded on the photographic plate. The plate is then developed and interference lines of the hologram provide a measurement of the film or material deposited between exposure.

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**3,744,913**

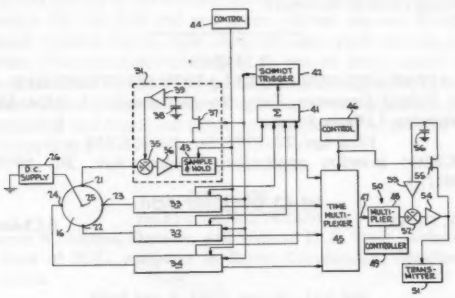
## DEVICE FOR DETERMINING RELATIVE ANGULAR POSITION BETWEEN A SPACECRAFT AND A RADIATION EMITTING CELESTIAL BODY

**Winfield H. Farthing, Lanham, Md., and Herbert F. Frisbie, Springfield, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Feb. 24, 1972, Ser. No. 229,128**

**Int. Cl. G01b *11/26***

**U.S. Cl. 356—141** **16 Claims**




Signals indicative of the relative angular position between a spin stabilized spacecraft, probe, or sounding rocket and a radiation emitting celestial body are derived with a detector including four electrodes for deriving indications of the centroid the radiation image on the detector. During each spin of the satellite each electrode derives a signal having a first non-zero level while the detector is not illuminated by the radiation and a sound non-zero level while it is illuminated by the radiation. The first level is indicative of dark current, while the second level is dependent upon dark current, the angular position of the centroid of the image on the detector surface relative to the electrode, and the intensity of the radiation impinging on the detector. A processing network, including a negative feedback loop, responds to the signal to derive, during each spin of the spacecraft, a signal indicative of the dark current. The dark current indicating signal is combined, in the feedback loop, with the electrode output to derive an output signal having a substantially zero value while the dark current is being generated. The image of the body is formed on the detector surface with a pinhole.

**3,744,914**

## AUTOMATIC POSITIONING DEVICE

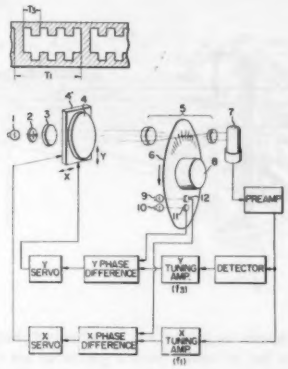
**Tsunemi Gonda, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Dec. 6, 1971, Ser. No. 204,813**

**Claims priority, application Japan, Dec. 4, 1970, 45/106768; Dec. 4, 1970, 45/106769**

**Int. Cl. G01b *11/26***

**U.S. Cl. 356—152** **10 Claims**




An automatic positioning device for automatically positioning an object in a plane comprises a light source for illuminating a member formed with an opening through which light from the light source may pass, scanning means having a chart of a predetermined period and moved at a predetermined speed, and an optical system for focusing the light passed through the opening so as to form an image of the opening on the chart. The chart is adapted to scan the image of the opening when the scanning means is moved, thus providing a light control signal of the same period as that of the chart. The light control signal is received by a photoelectric element, which converts the light control signal into an electrical control signal. Reference signal generating means is provided to generate an electrical reference signal which is synchronous with and of the same period as the electrical control signal. The electrical control signal and the electrical reference signal are applied to phase difference measuring means, which measures the phase difference between these electrical signals. Drive means is provided which is operable in response to an output signal from the phase difference measuring means to move the member formed with the opening relatively to said optical system in a direction perpendicular to the optical axis of the optical system so that the difference between the electrical control and reference signals attains a predetermined level.

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**3,744,915**

## PHOTOELECTRIC LENGTH MEASURING APPARATUS

**Erwin Sick, Stifterweg 6, 8021 Icking/Isartal, Germany**

**Filed Dec. 13, 1971, Ser. No. 206,548**

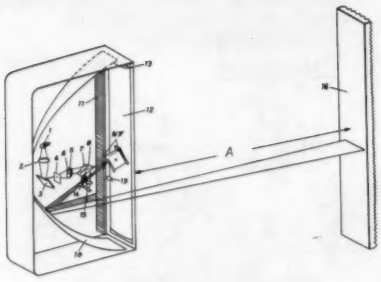
**Claims priority, application Germany, Dec. 12, 1970, P 20 61 235.5**

**Int. Cl. G01b *11/04***

**U.S. Cl. 356—160** **8 Claims**

A beam from a light source traverses a first diaphragm having a slit therein and then a second diaphragm having different sized openings to form first and second partial beams. The two partial beams go through an inclined partially-transmission partially reflective mirror to a reflective rotor. The reflective rotor is positioned at the focal point of a parabolic reflector strip so that the light therefrom is projected at the focal plane of the strip. At the focal plane is a raster reflector and a cylinder lens. The cylinder lens projects the first partial beam across the area within which is the object to be measured. At the opposite side of that area is a reversing reflector. The

reflected partial beams from the reversing reflector and the raster reflector go back via the parabolic reflector, the reflective rotor and the mirror to respective photoelectric receivers. The signal from the receiver getting the first partial beam



opens an "and" gate for the period during which the first partial beam is blocked by the object. The light pulses from the second partial beam produce electrical pulses that go through the "and" gate for so long as it is open.

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**3,744,916**

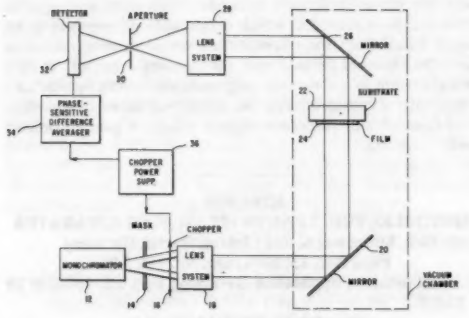
## OPTICAL FILM THICKNESS MONITOR

**Paul B. Bey, Temple Hills, and Raymond A. Patten, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed June 8, 1971, Ser. No. 151,049**

**Int. Cl. G01b** *11/00*

**U.S. Cl. 356—161** **3 Claims**




Apparatus for measuring the optical thickness of a thin film on a substrate by utilizing two light beams of different wavelengths. The beams are chopped into a series of time-alternating pulses, passed through the film and substrate and detected to provide an electrical pulse output. Alternate pulses are then subtracted from each other and the differences are averaged. A null occurs whenever the optical film thickness is at integral quarter-wavelengths of the average wavelength of the two light beams.

**3,744,917**

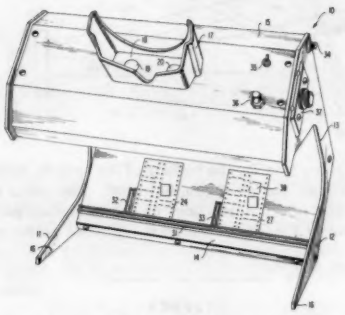
## OPTICAL COMPARISON DEVICE USING AN OPTICAL DIFFUSER

**Dwin R. Craig, Gaithersburg, Md., assignor to Symbionics, Inc., Annapolis, Md.**

**Continuation of Ser. No. 803,250, Feb. 28, 1969, abandoned. This application May 14, 1971, Ser. No. 143,577**

**Int. Cl. G01b** *11/24*; **G02b** *21/20*; **G06k** *9/08*

**U.S. Cl. 356—168** **4 Claims**



A comparison device in which objects to be compared are arranged in side-by-side relation and when viewed through a mirror system are caused to appear as one object with each object being viewed by a respective one of the observer's eyes. A rotating shutter intermittently and successively interrupts the path of light to each eye so that the fused images are actually viewed successively rather than simultaneously. Differences in the objects being compared appear as pulses of the missing detail of the object.

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**3,744,918**

## APPARATUS FOR CORRELATION SPECTROSCOPY

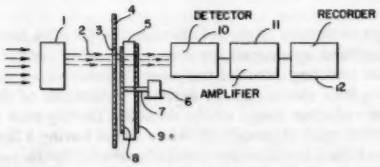
**Jan Roland Jacobsson, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden**

**Filed Apr. 23, 1971, Ser. No. 136,739**

**Claims priority, application Sweden, Apr. 30, 1970, 6001/70**

**Int. Cl. G01j** *3/02*, *3/50*

**U.S. Cl. 356—188** **8 Claims**




Arrangement for correlation spectroscopy by means of the absorption or emission spectrum of a gas. Light from the gas is arranged to be fed to an analyzer, comprising a light transmitting disc arranged in front of a detector. One side of the disc is supplied with an interference filter which within at least one segment of the filter has transmission characteristics as a function of the wavelength within a determined range of wavelengths. The range of wavelengths corresponds to the absorption or emission spectrum of a searched ingredient in the gas. The other parts of said filter have different transmission characteristics. These parts have different transmission

characteristics relative to one another and are arranged to be alternatively inserted into the beam path in front of the detector.

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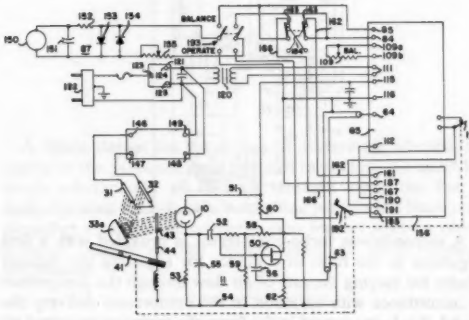
3,744,919

## COLOR MEASURING WITH MEMORY

Raymond E. Babb, Fremont, Calif., assignor to Genevieve I., (formerly Genevieve I. Magnuson) Hanscom, Santa Cruz; Genevieve I. Magnuson, San Jose; Robert Magnuson, San Jose and Lois J. (formerly Lois J. Duggan) Thomson, as Trustees of the Estate of Roy M. Magnuson, San Jose, Calif., part interest to each

Continuation of Ser. No. 879,295, Nov. 24, 1969, abandoned.
This application July 16, 1971, Ser. No. 163,294
Int. Cl. G01j 3/48; G01n 21/48
U.S. Cl. 356—189 7 Claims



A manually operable portable direct reading apparatus and method providing reflectance measurements in two spectral modes, for example red and green without the use of high speed rotating filters, light choppers and synchronizing devices. The signal corresponding to one of these modes is stored in a memory for comparison with the signal from the other mode. Ratios between these modes are automatically computed and displayed either as a mathematical ratio or as a numerical value.

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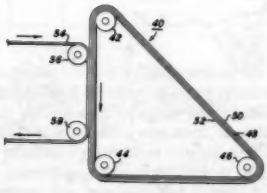
3,744,920

## DETECTION SYSTEM

James E. Adams, Ontario, and Werner E. L. Haas, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,344
Int. Cl. G02b 27/32; G01n 21/16
U.S. Cl. 356—256 26 Claims



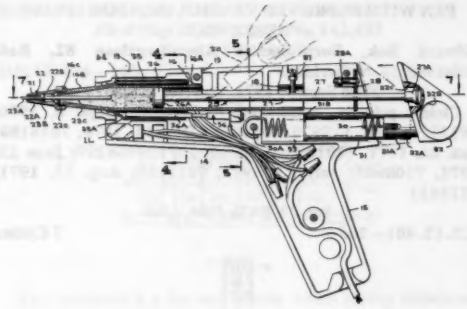
A system for identifying the presence of physical surface patterns and/or areas in a surface which have different electrical conductivity characteristics from those of adjacent areas of the same surface. The system utilizes the optical characteristics of liquid crystal films having optically negative properties.

3,744,921

## GLUE GUN CONSTRUCTION

Carl E. Weller, Easton, Pa., and Alden J. Brassaw, Phillipsburg, N.J., assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 7, 1971, Ser. No. 141,110
Int. Cl. B05c 5/02; B67d 5/62
U.S. Cl. 401—2 15 Claims



An electrically heated glue gun having an elongated tubular melt chamber for receiving a solid adhesive rod near one end thereof and having a convergently tapering portion at is other end, a nozzle coupled on the other end of the melt chamber having a bore defining a discharge orifice and a valve seat, a heating element for heating the adhesive in the melt chamber to a molten state, a plunger movable axially through the melt chamber for pressing the adhesive forwardly, a valve in the nozzle bore for normally closing against the valve seat and having a pin extending through the discharge orifice to be engaged by the work for opening the valve, and a spring mechanism to be releasibly coupled with the plunger to urge the plunger forwardly.

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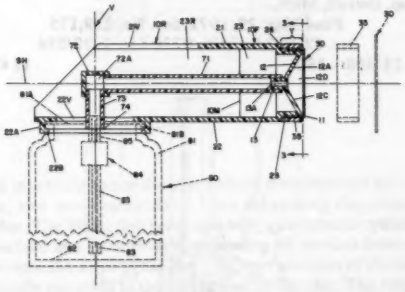
3,744,922

## APPLICATOR FOR FLUIDS

Lowell T. Fears, Omaha, Nebr., assignor to D'Sal Products, Inc., Memphis, Tenn.

Filed Feb. 28, 1972, Ser. No. 229,879
Int. Cl. A46b 5/02
U.S. Cl. 401—190 9 Claims



There is provided an applicator adapted to be employed in removable and communicating relationship with an uprightable hand-manipulatable container of pressurized fluid, such as liquid masking tape, paints, etc., whereby the fluid bands or stripes can be controllably applied from the applicator foreterminus to upright window panels and other broad working surfaces. The applicator includes a housing extending longitudinally forwardly along a main-axis that intersects the container lengthwise axis, the housing forwardly terminating as an annular lead-end defining a lead-plane which transversely in-

tersects the main-axis; a porous pad firmly abutting the housing leadhend and preferably removably attached to the housing provides the applicator fore-terminus. There is a regulatable tubular conduit means extending from its inlet-end (which is transversely offset toward a fluids container) to an outlet-end located slightly rearwardly of the lead-plane and in fluid delivery relationship to the porous pad.

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**3,744,923**

**PEN WITH IMPROVED VENTILATION FOR ITS INK RESERVOIR**

**Edward Bok, Burgemeester Amersfoortlaan 82, Badhoevedorp, Netherlands**

**Filed Sept. 7, 1971, Ser. No. 178,367**

**Claims priority, application Netherlands, Sept. 8, 1970, 7013334; Nov. 3, 1970, 7016060; Dec. 14, 1970, 7018180; Jan. 26, 1971, 7101029; June 16, 1971, 7108297; June 23, 1971, 7108645; July 23, 1971, 7111159; Aug. 13, 1971, 7111433**

**Int. Cl. B43k** *5/04, 1/10*

**U.S. Cl. 401—265** **7 Claims**

Writing or drafting pen of the type having an ink reservoir, a vent system upwardly extending from the lower end of the pen to the top of said pen and in said pen a supply source of vapor to prevent the clogging up of said vent system with dried ink.

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**3,744,924**

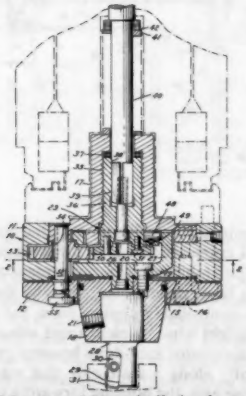
**DEFLECTABLE BORING QUILL**

**George J. Levosinski, Detroit, and Joseph Mitkiewicz, Farmington, both of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.**

**Filed Mar. 29, 1972, Ser. No. 239,175**

**Int. Cl. B23d** *77/06;* **B23b** *51/00, 29/034*

**U.S. Cl. 408—156** **11 Claims**



A boring quill for use with a spindle having means provided for extending or retracting the cutting tool of the apparatus either automatically or semi-automatically, and additionally having means for varying the extended position of the cutting tool to compensate for tool wear.

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**3,744,925**

**APPARATUS FOR REGULATING A TURBO-COMPRESSOR**

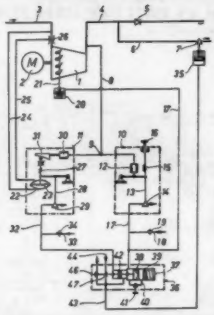
**Wendelin Kraemer, Frankfurt, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland**

**Filed June 15, 1971, Ser. No. 153,229**

**Claims priority, application Switzerland, June 23, 1970, 9455/70**

**Int. Cl. F01b** *25/00*

**U.S. Cl. 415—17** **3 Claims**



A motor-driven turbo-compressor is provided with a first regulator in the form of a device for adjusting the diffusor blades for varying the rate of air flow through the compressor in accordance with variation in the compressor delivery demand, this being sensed in the form of a variation in output air pressure at the delivery side of the compressor and which produces a first signal which actuates the diffusor blade adjusting device. An anti-surging regulator controlled jointly by the air throughput rate and the output air pressure is also provided and produces a corresponding second signal. This second signal is combined with the first signal in a decoupling relay to produce a third signal which serves to actuate a blow-off valve located in the blow-off duct connected to the delivery duct of the compressor. The decoupling relay is also provided with an arrangement by which the first signal admitted to it is cancelled with an adjustable time delay so that it does not participate in forming the third signal when the regulating system is operating in a steady state mode.

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**3,744,926**

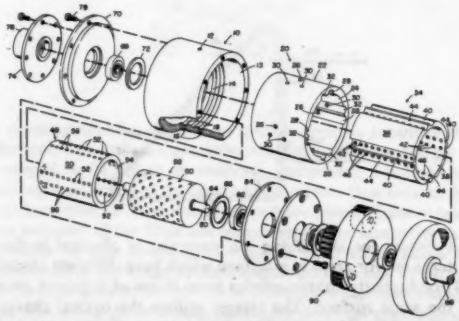
**ROTARY ENGINE**

**Joseph Ross Hedges, P.O. Box 32, Hiawatha, Iowa**

**Filed May 22, 1972, Ser. No. 255,376**

**Int. Cl. F01d** *1/00*

**U.S. Cl. 415—92** **11 Claims**



A rotary engine or turbine which uses a pressurized gas to drive a rotor and thereby produce rotary motion. The turbine

has a solid cylindrical shaped rotor containing a multiplicity of flutes formed around its periphery. It also has a unique porting arrangement which uniformly directs the gas onto the flutes through multiple inlet ports that are aligned with corresponding exhaust ports thereby utilizing the energy of the pressurized gas to the maximum extent.

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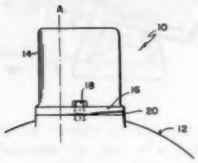
**3,744,927**

## YIELDABLE BLADES FOR PROPELLERS

**Henry J. Bernaerts, Amberley, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 23, 1971, Ser. No. 117,988**
**Int. Cl. B63h *1/20***
**U.S. Cl. 416—2** **1 Claim**




A blade design for propellers of watercraft wherein the blades of the propeller are weakened in the line of impact but retain substantially all of their strength along the line of hydrodynamic load. Such a weakening permits the blades of a propeller to shear off or yield upon impact with an object without damage to the motor, shaft or pitch changing mechanism.

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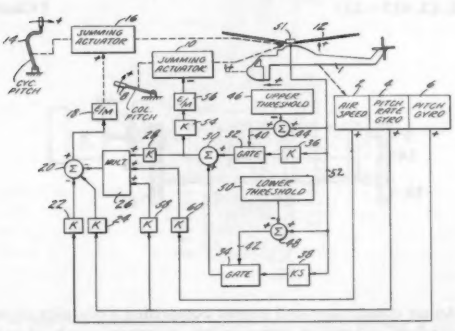
**3,744,928**

## ROTOR OVERLOAD PROTECTION

**Knute C. Hansen, Shelton, and John C. McKeown, Bridgeport, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.**

**Filed Oct. 7, 1971, Ser. No. 187,341**
**Int. Cl. B64c *27/66***
**U.S. Cl. 416—31** **3 Claims**




Overloading of rotor blades in a vertical lift aircraft such as a helicopter is avoided by limiting blade pitch to a value below that at which permissible loading will obtain. Strain in the blade pitch rods is monitored and used, together with the rate of change thereof as a pitch limit control signal to limit the effect of pilot control on the actual pitch of the rotor blades. In one embodiment, the strain in the rotor pitch push rods is compared against a lower threshold load value, and an excess causes the rate of change of the strain to be utilized as one input to the pitch limiting control signal; the load is also compared to an upper threshold, and an excess causes the actual load to be used as a second input to the pitch limit control signal. The pitch limit control signal in one embodiment is applied directly to the collective pitch outer loop (or major control loop), but is further modified when applied to the longitudinal cyclic pitch outer control loop. The further modification multiplies the limiting signal with air speed and pitch rate to prevent unwanted longitudinal pitch input at low air speeds, particularly as a result of excess commands in collective pitch.

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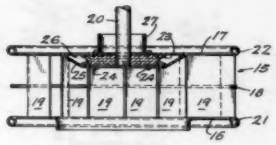
**3,744,929**

## BLOWER AND FAN WHEEL APPARATUS

**Richard L. Huntington, Route 1, Van Buren, Ohio**

**Filed May 11, 1971, Ser. No. 142,183**
**Int. Cl. F04d *29/00***
**U.S. Cl. 416—145** **9 Claims**




The invention is a fan and blower wheel having hollow annular counterbalance chambers concentric with a central drive shaft. Initial counterbalancing is accomplished by filling one or more of the chambers with a liquid thermosetting plastic containing heavy and light fillers. The fillers segregate under the force of rotation and are hardened in place. Final counterbalancing for dynamic vibrations and for future inbalance caused by dirt build up, corrosion or abrasion is accomplished by partially filling one or more of the remaining concentric annular counterbalance chambers with a dense fluid which is free to move. Preferably, the dense fluid also includes high density material such as lead shot or ball bearings.

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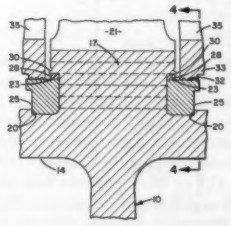
**3,744,930**

## BLADE DISC STRUCTURE FOR TURBOMACHINES

**Alexander A. Carroll, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Mar. 2, 1972, Ser. No. 231,296**
**Int. Cl. F01d *5/32***
**U.S. Cl. 416—174** **8 Claims**




The invention has to do with a blade disc structure for turbo rotors, and more particularly, with the sealing ring structure therefor. The blade disc is formed with a peripheral cylindrical rim surface and an outwardly extending rib portion formed intermediate the sides of the rim. The root portions of the blades are fixedly mounted in the rib portion of the disc. The cylindrical peripheral rim surface of the disc is formed with a circumferentially extending shoulder spaced axially from each side of the rib portion. The rib portion is formed, at each side, with a circular shoulder spaced concentrically outwardly from the rim portion. Sealing ring members are positioned between the rim shoulders and each side of the rib and having a snug fit therewith. Caulking ring sections are positioned between the periphery of the sealing ring members and the shoulder formed in the rib portion. The caulking ring sections have snug engagement with the periphery of the sealing ring struc-

ture and the inner surface of the shoulder formed on the rib portion. The caulking ring sections are retained in place, preferably by peening areas in the sides of the rib portion over the outer surface of the caulking ring sections.

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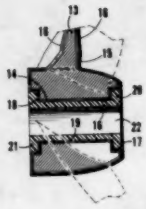
3,744,931
BRINE RESISTANT PROPELLER

John R. Cavanagh, Toronto, Ontario, Canada, assignor to Logic Systems Corporation Limited, Toronto, Ontario, Canada

Filed July 26, 1971, Ser. No. 165,443
Int. Cl. B63h 1/14
U.S. Cl. 416—224 7 Claims




The specification discloses an aluminum alloy propeller for marine use especially in sea water and which has an entire coating of a vulcanized rubber composition thereon.

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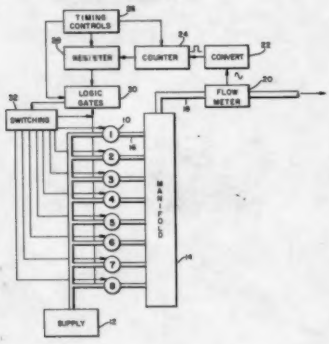
3,744,932
AUTOMATIC SEQUENCE CONTROL SYSTEM FOR PUMP MOTORS AND THE LIKE

Peter D. Prevett, Melrose, Mass., assignor to Prevett Associates, Inc., Melrose, Mass.

Filed Apr. 30, 1971, Ser. No. 138,885
Int. Cl. F04b 41/06
U.S. Cl. 417—8 10 Claims

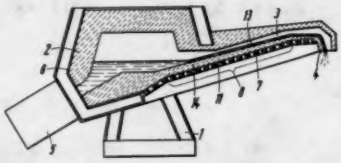



A system is provided for automatically controlling the number and sequence of operation of a plurality of motive devices such as pump motors in a common pumping system. The flow rate of a pumped liquid or other medium is monitored by a flow meter which generates a frequency output related to the flow rate. The flow meter output is converted to digital form to drive a counter having an output to a storage register. Timing controls operate the counter, storage register and logic gates receiving the output of the storage register and these in turn operate the motors controlling both the sequence of their operation and number in operation according to demand requirements as monitored by the flow meter. Switching means are provided to automatically by-pass disabled equipment and cyclically to vary the operating sequence so as to distribute uniformally use of the motors, pumps and the like.

3,744,933
ELECTROMAGNETIC CONVEYING TROUGH

Friedrich Scheffler, Remscheid, and Axel von Starck, Remscheid-Luttringhausen, both of Germany, assignors to AEG-Elotherm GmbH, Remscheid-Hasten, Germany

Filed Aug. 31, 1971, Ser. No. 176,608
Claims priority, application Germany, Nov. 9, 1970, P 20 55 004.3
Int. Cl. H02k 45/00; H02n 4/20
U.S. Cl. 417—50 12 Claims



An electromagnetic conveyor of the type having an upwardly sloping trough body, and a travelling field inductor disposed adjacent the body for generating a travelling electromagnetic field to propel liquid metal up the trough body. The inductor is disposed so that the strength of the field at a surface of the body bounding the liquid metal increases along the trough length. In one embodiment, a refractory lining is disposed between the bounding surface and the inductor such that its thickness, and the distance between the bounding surface and inductor, decreases along the length of the trough body.

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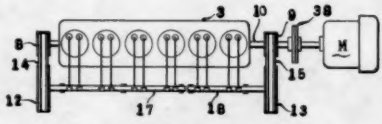
3,744,934
AIR COMPRESSOR

Takahiro Ueno, 5-11, 4-Bancho, Wakayama, Japan

Continuation-in-part of Ser. No. 873,881, Nov. 4, 1969. This application Sept. 22, 1971, Ser. No. 182,613
Claims priority, application Japan, Nov. 15, 1968, 43/83909
Int. Cl. F04b 41/04, 7/00
U.S. Cl. 417—237 1 Claim



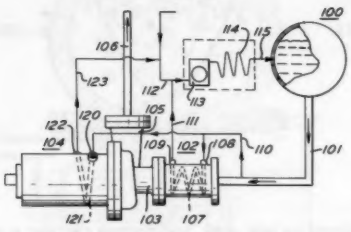

An air compressor and engine comprising a plurality of independent cylindrical compression chambers, each of said compression chambers having an inlet valve, an exhaust valve and a piston connected by rods to a crank-shaft, said plurality of chambers in two sets, the first set of chambers being greater in number than the second set of chambers, whereby the apparatus serves as an air compressor in which said first set of chambers are adapted for the primary compression chambers for feeding the compressed air to said second set of chambers provided for further compression of the air, or as an air compressor and engine in which said first set of chambers are adapted for the engine by means of suitable switching means, while said second set of chambers for an air compressor, or as an engine in which said first and second sets of chambers are adapted for the engine by means of said switching means.

3,744,935

## COOLING SYSTEMS FOR MOTOR DRIVEN PUMPS AND THE LIKE

Reinald G. Magni, Croydon, Pa., assignor to Crane Co., New York, N.Y.

Filed Oct. 7, 1971, Ser. No. 187,361
Int. Cl. F04b *39/02, 39/06*
U.S. Cl. 417—370 6 Claims



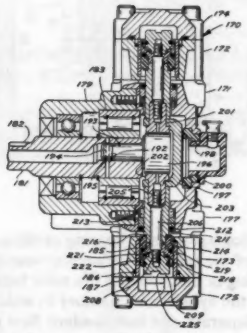
Cooling systems for motor driven pumps and the like are disclosed which include the use of a sub cooler applied to motor driven pumps and the like that impel low boiling fluids and include provisions for bleeding a small portion of the pumped fluid, flashing the fluid for cooling, using the vapor to cool the pumped fluid and/or circulating the vapor around the pump to cool the bearing and other critical areas susceptible to excessive heating.

3,744,936

## PISTON TYPE PUMP

Harry J. Sadler, Minneapolis, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 530,027, Feb. 25, 1966, abandoned. This application Mar. 13, 1968, Ser. No. 716,271
Int. Cl. F04b *21/04*
U.S. Cl. 417—536 20 Claims



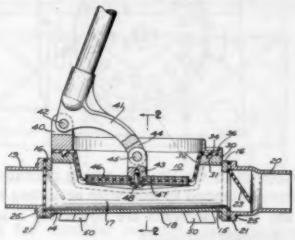
A positive displacement piston type pump having a drive housing portion and a pair of cylinder block housings secured to opposite faces of the drive housing, and a head secured over each of the cylinder block housings. Each cylinder block housing is provided with bores for forming a pumping cylinder, and also to retain the valves required for controlling the flow of fluids through the pump. The cylinder block housings therefore are provided with those individual components of the pump which are subject to the greatest wear, and therefore this arrangement enables a quick inter-change of components without requiring any substantial disassembly of the pump. Improved drive means are provided which enable the device to be operated under severe operating conditions, these components also being formed to provide ease of disassembly and servicing.

3,744,937

## DIAPHRAGM PUMP

John H. Collamore, Jr., Barrington, R.I., assignor to Dart Union Company, Providence, R.I.

Filed Apr. 21, 1969, Ser. No. 817,891
Int. Cl. F04b *21/06*
U.S. Cl. 417—565 2 Claims



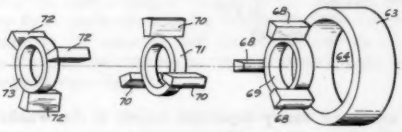
A diaphragm pump having a chamber with a bottom wall and a straight line channel providing a passage from supply to discharge across the chamber below the bottom wall with this channel opening upwardly into the bottom wall of the chamber and with a diaphragm fixed to the upper periphery of the chamber and flexing into the chamber to displace a major portion of the fluid in the chamber.

3,744,938

## ALTERNATING VANE TYPE ROTARY ENGINE WITH PLANETARY GEAR SYSTEM

Alexander Matvey, 12 Green Acre Lane, Westport, Conn.

Filed Dec. 1, 1970, Ser. No. 94,122
Int. Cl. F01c *1/00, 21/16;* F04c *29/10*
U.S. Cl. 418—18 3 Claims



This invention is directed to a closed cycle vapor power generating system and includes (1) a rotary vapor condenser enclosed by (2) an associated rotary vapor generator with both being operably connected to (3) an energy converter that receives high pressure vapor from the generator and returns low pressure expanded vapor to the condenser, and to (4) a combustion unit therefor, and to (5) a vapor process therefor. The energy convertor preferably is a rotary vapor engine including three sets each of three radial vanes located 120° apart which are operatively connected to a hypocycloidal planetary gear system for progressive movement of the sets toward and away from each other, the gear system being adjustable to vary the torque of the engine.

3,744,939

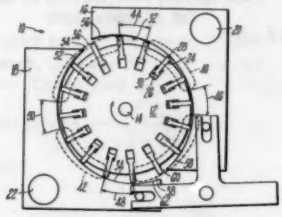
## VARIABLE DISPLACEMENT VANE PUMP

Charles W. Grennan, Newington, and John E. Cygnor, Middletown, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Continuation of Ser. No. 825,497, May 19, 1969, abandoned. This application June 25, 1971, Ser. No. 156,789
Int. Cl. F01c *21/16;* F03c *3/00;* F04c *15/04*
U.S. Cl. 418—30 16 Claims

A variable displacement vane pump is presented in which the seal blocks are pivoted to control pump operation. The pump is double acting in that it has two pairs of opposed fluid

inlet and discharges to minimize bearing loads. The seal blocks are appropriately contoured to provide desired vane displacement for pumping and also to provide the necessary



sealing to accomplish the double acting operation. The seal blocks are force balanced to minimize actuating load requirements, and the vane elements are physically retained within their slots by stopping shoulders.

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**3,744,940**

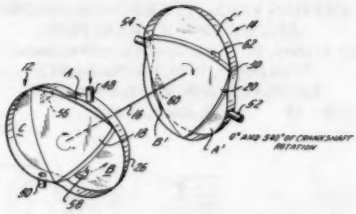
**ROTARY EXPANSION ENGINE OF THE WANKEL TYPE**

**Erold F. Pierce, Lakewood; Richard M. Gigon, Westfield, and Walter L. Hermes, Cedar Grove, all of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.**

**Filed Dec. 16, 1971, Ser. No. 208,692**

**Int. Cl. F01c *1/02*; F04c *1/02, 17/02***

**U.S. Cl. 418—60** **11 Claims**



A multi-unit rotary expansion engine of the Wankel type capable of operating with pressurized gaseous or vaporous fluid. Each unit has a rotor housing within which a multi-lobed rotor rotates with and about an eccentric or crank portion of a crankshaft drivably connected to the rotor, the rotor and housing defining therebetween a plurality of working chambers which successively expand and contract in volumetric size as the rotor rotates relative to the housing. Each unit includes a plurality of spaced inlet ports and exhaust ports communicating with the working chambers to admit pressurized fluid into the latter and pass exhausted pressurized fluid from the working chambers. Valve means is provided for each of said inlet ports for controlling admission of pressurized fluid into the working chambers for a period of more than 90° of rotation of the crankshaft. The rotors of the multi-unit expansion engine are angularly offset relative to each other 180° so that with the timing of operation of the intake valves at least one inlet port is open to its associated working chamber and instant starting of the mechanism upon application of pressurized fluid to the inlet ports is achieved.

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**3,744,941**

**MECHANISM FOR ROTARY ENGINE**

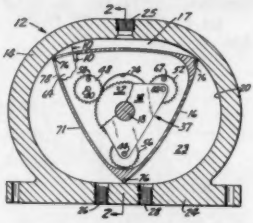
**Leonard R. Nestor, 2139 Magnolia Avenue E., St. Paul, Minn.**

**Filed Nov. 30, 1971, Ser. No. 203,211**

**Int. Cl. F01c *1/02***

**U.S. Cl. 418—61** **8 Claims**

Mechanism useful in preparing the stator cavity of a rotary engine and in constraining the rotor of said engine to oscillatively revolve around a main shaft in conformity with said cavity comprises planetary pinions meshing with a spur gear



and centered on said shaft, said pinions carrying a workplate on identically radially offset crank pins.

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**3,744,942**

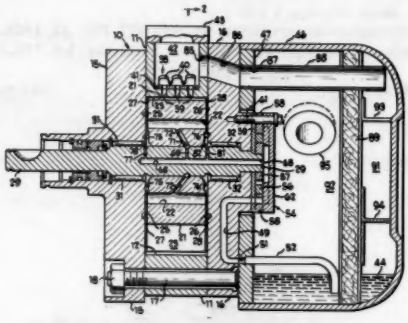
**ROTARY SLIDING VANE COMPRESSOR WITH HYDROSTATIC BEARINGS**

**Alfred G. Mount, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed July 16, 1971, Ser. No. 163,194**

**Int. Cl. F01c *21/00, 21/04*; F04c *29/02***

**U.S. Cl. 418—76** **8 Claims**



A pair of oil-filled hydrostatic bearing cavities, respectively on the two sides of the compressor's rotor near its axis, effect automatic centering or balancing of the rotor between the end walls or plates of the cylindrical chamber in which it is eccentrically rotated. Separate and independent flow paths convey pressurized oil from a common oil source and through parallel flow control orifices to the bearing cavities, after which the oil flows radially outward along the two rotor faces and through restrictive clearances between those faces and the adjacent end walls to the compression chamber where it entrains into the gas. If the rotor tends to shift axially from its centered position, one of the clearances reduces thereby increasing the oil pressure drop along that face while the other clearance increases and this lowers the pressure drop along that side of the rotor. As a result of the changing pressure drops, the oil pressure increases in the bearing cavity on the decreasing-clearance side while at the same time the pressure decreases in the cavity on the increasing-clearance side. A compensating or corrective force thus develops to reposition the rotor to its centered location, whereupon the oil pressures in the cavities assume appropriate levels to maintain such centering.

3,744,943

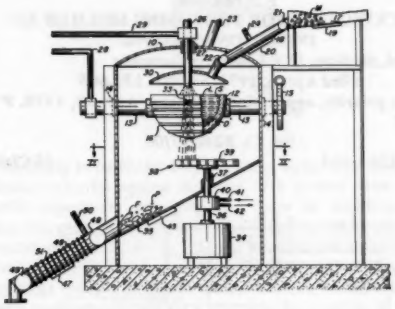
## APPARATUS FOR CONVERTING MISCELLANEOUS PIECES OF REACTIVE METAL TO A USABLE FORM

Howard B. Bomberger, Jr., and Harold D. Kessler, both of Canfield, Ohio, assignors to RMI Company, Niles, Ohio

Division of Ser. No. 74,201, Sept. 21, 1970, Pat. No. 3,646,175, which is a continuation of Ser. No. 726,400, May 3, 1968, abandoned. This application Aug. 20, 1971, Ser. No. 173,437

Int. Cl. B29c *23/00*

U.S. Cl. 425—6 11 Claims



Pieces of a reactive metal, such as titanium or zirconium, are melted on a hearth within a chamber which is evacuated or filled with inert gas. Stream of molten metal overflows the hearth and is acted on by a mechanism which disperses it into small particles. The particles solidify as pellets and/or flakes which are readily blended with sponge metal and used in making up a melting charge. Dense inclusions in the starting material sink to the bottom of the hearth and thus are eliminated from the product.

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3,744,944

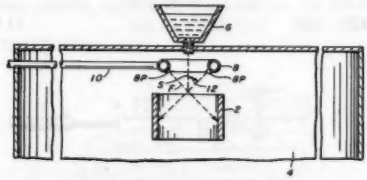
## APPARATUS FOR PRODUCING METAL POWDER

Hung-Chi Chao, 3722 Northern Pike, Monroeville Borough, Pa.

Filed Mar. 31, 1971, Ser. No. 129,723

Int. Cl. B29c *23/00*

U.S. Cl. 425—7 5 Claims



Molten metal, particularly molten steel, is atomized by directing an atomizing fluid stream against a falling stream of the molten metal. The atomized molten metal is directed against an impingement plate which is positioned relatively close to the point of intersection of the metal stream and fluid stream to obtain a maximum of relatively fine irregular particles and which is positioned relatively far from the point of intersection to obtain the maximum of generally spherical particles. It is preferred to direct a fluid jet downwardly and inwardly into the falling stream from only one side of the falling stream. My preferred apparatus includes a closed tank having an annealing chamber at its bottom. By using a non-oxidizing gas as the atomizing fluid, the pellets produced can be used for powder metallurgical uses without further processing.

3,744,945

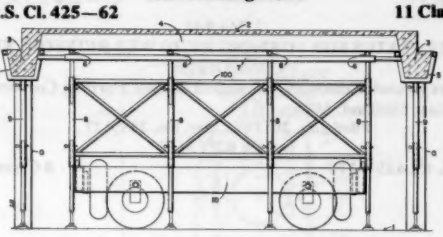
## APPARATUS FOR MODULAR CONCRETE CONSTRUCTIONS

Charles E. Metrailer, 3613 Government St., Baton Rouge, La.

Filed Nov. 30, 1719, Ser. No. 203,273

Int. Cl. E04g *11/36*

U.S. Cl. 425—62 11 Claims



Apparatus for modular concrete constructions. The apparatus comprises a carriage and a concrete form. It also comprises the combination of a concrete form detachably mounted on a portable carriage the former of which can be set in place and positioned for pouring. The carriage can then be detached from the concrete form, removed for further service and later reunited with the form for transport to a new pour position, as desired. The concrete form per se is comprised generally of a support structure atop which is provided a pour form. The pour form is constituted of a central span and, preferably, a pair of upwardly faced troughs located on opposite sides of the central span. The central span of the pour form can range from flat to highly contoured. The troughs are each provided with a plurality of bottom openings, these being formed between removable panels. In forming a module, wet concrete can be poured upon the central span of the pour form to form a roof, ceiling, or floor while a tubular member or column form can be fitted into the openings of the troughs at the column locations and wet concrete can be poured therein and into the troughs to cast columns and beams for support of the roof, ceiling or floor. After the concrete has set the pour form can be lowered, the troughs freed by removal of the panels at the columns, and the beam forms moved inwardly. The carriage can then be removed to an adjacent location for further pouring.

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3,744,946

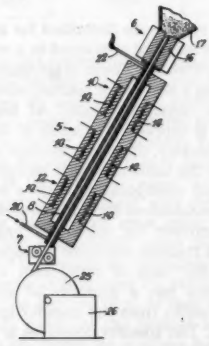
## APPARATUS FOR FABRICATING CONTINUOUS ELONGATED COMPONENTS

Ernest U. Lang, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Continuation-in-part of Ser. No. 41,912, June 1, 1970. This application Oct. 15, 1971, Ser. No. 189,709

Int. Cl. B22f *3/16*; B29f *3/06*

U.S. Cl. 425—79 17 Claims



Apparatus for processing an elongated component characterized by being shrinkable upon sintering or reducing and

sintering in which the elongated component passes through sintering and/or reducing and sintering furnace means in a manner so that the elongated component will pass through the furnace means without producing substantial buckling or fracturing of the elongated component.

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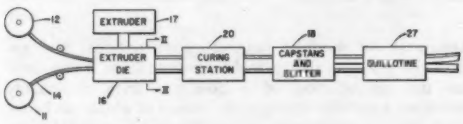
**3,744,947**

## APPARATUS FOR FORMING RIGID WEB-REINFORCED COMPOSITES

**Max Skobel, Edison, N.J., assignor to Dow Corning Corporation, Midland, Mich.**

**Filed Jan. 20, 1972, Ser. No. 219,427**
**Int. Cl. B29f *3/10***
**U.S. Cl. 425—114** **4 Claims**




Apparatus for forming rigid web-reinforced extruded composites in which a pair of webs are fed through an extrusion die in spaced parallel relationship, the die being shaped to form two extrusions joined in mirror image relationship and wherein the extrusions are pulled through a curing station and past a slitter knife by driving the reinforcing webs. The slit extrusions can then be cut to length. Useful applications include windshield wiper blades and seals.

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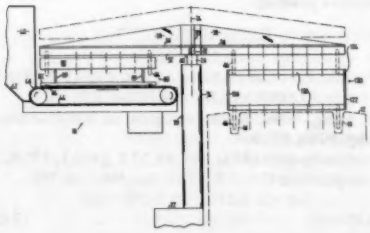
**3,744,948**

## STICK INJECTOR WITH VACUUM PICKUP

**Italo Caroli, Westmount, Quebec, Canada, assignor to DBM Industries Limited, Montreal, Quebec, Canada**

**Filed June 15, 1971, Ser. No. 153,189**
**Int. Cl. A23g *5/02***
**U.S. Cl. 425—125** **9 Claims**



An apparatus and system are described for inserting sticks into liquid confection material contained in a mold being carried along, preferably through a bath of refrigerant. A transfer spider assembly having a number of laterally-extending arms is mounted beside the refrigerant bath. At least one stick-gripping mechanism is supported by each of the arms of the spider assembly. Preferably, these mechanisms are grouped in clusters which enable the same to receive and grip sticks being provided in a selected configuration from a supply hopper. Each stick-gripping mechanism includes elements biased into contact with one another for releasably gripping a stick therebetween. A stick transfer conveyor is supported in operative relationship to the bath of refrigerant and the molds therein. This conveyor has a plurality of stick-supporting flights for accepting sticks from the transfer spider assembly and supporting them. The transfer conveyor is adapted to be driven in synchronism with the movement of said molds and is positioned to enable said stick-supporting flights to insert sticks into the liquid confection material in the molds, support the sticks therein and to automatically enable release of the same after a predetermined amount of travel and solidification of the confection material. Preferably, sticks are supplied by a vacuum-operated supply means having a pair of vacuum pick-up heads supported at approximately 90° to one another by a pivotally movable yoke assembly. Each vacuum pick-up head is adapted to be connected to a vacuum source, is provided with a series of passageways, and slideably supports a perforated plate. This plate is perforated and shaped so as to enable picking up sticks in the desired configuration, one stick for each mold containing ice cream and two sticks for each mold containing a popsicle confection.

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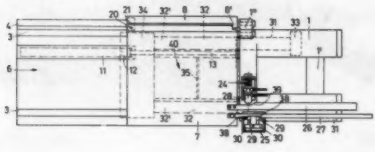
**3,744,949**

## LOCKING UNIT FOR THE CASING MOLD OF AN INJECTION MOLDING

**Karl Hehl, Siedlung 183, Lossburg, Germany**

**Filed Apr. 6, 1971, Ser. No. 131,665**
**Claims priority, application Germany, Apr. 24, 1970, P 20 20 061.7**
**Int. Cl. B28b *17/00***
**U.S. Cl. 425—153** **15 Claims**



A clamping unit for clamping the mold of an injection molding machine has at least one removable protective cover for covering the clamping unit in the area of the mold. The cover has at least three protective cover plates arranged to be moved independently of one another in the opening direction of the clamping unit between an open position and a protective position. Switches and a safety valve are associated with the cover for interrupting the main current and fluid flows of the injection molding machine when all of the cover plates are in their open position.

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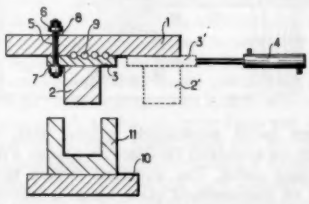
**3,744,950**

## PRESSURE MOLDING DEVICE

**Paul Courtois, 151 Boulevard de Stalingrad 94, Vitry-Sur-Seine, France**

**Filed June 9, 1971, Ser. No. 151,223**
**Claims priority, application France, June 9, 1970, 7021133**
**Int. Cl. B29c *3/00***
**U.S. Cl. 425—186** **11 Claims**



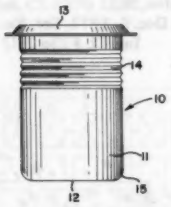
Pressure molding device comprising a core fixed to a support driven in a horizontal sliding movement along a vertically mobile plate, from a position immediately adjacent to the mold to a position at a distance from the said mold and vice-versa, means being provided for positioning the said support exactly adjacent to the said mold before the molding operation. The invention can be used more particularly for molding storage cell containers having a great height.

3,744,951

## SINTER MOLDING APPARATUS

Richard R. Szatkowski, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 821,337, May 2, 1969. This application Nov. 26, 1971, Ser. No. 202,398
Int. Cl. B29c 5/00
U.S. Cl. 425—259 12 Claims




Molding is performed by directing streams of comminuted plastic material against surfaces of a heated form or mold, while repeatedly sweeping the form or mold across the streams, progressively depositing the material in one or more predetermined zones, so that the material assimilates progressively along the form or mold surfaces. Apparatus for so molding large receptacles, such as drum liners, includes a series of open molds supported, on a turntable for rotation of the molds about their horizontal axes, with the open ends facing radially outward. The table is indexed relative to the various stations, at which successive steps of preheating, deposition, post-heating, cooling and stripping are performed. The deposition apparatus is on a carriage reciprocable radially of the table. A roll unit and several spray units direct streams of the material against the mold surfaces while the mold is rotated and maintained at a temperature suitable for incipient fusion of all the material substantially instantaneously upon impingement, so that the material adheres and fuses where deposited on the mold surfaces. When deposition is complete the mold passes through an arcuate oven overlying a sector of the table, for final sintering. The mold is then quenched, setting the material, whereafter the finished article is stripped from the mold.

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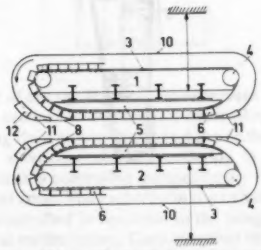
3,744,952

## CORRUGATION APPARATUS

Jean Francois Bequet, Brussels; Roger Van Asbroeck, Neerijse, and Paul Du Bois, Braine-L'Alleud, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Dec. 30, 1970, Ser. No. 102,606
Claims priority, application Belgium, Dec. 31, 1969, 83422
Int. Cl. B28b 3/12
U.S. Cl. 425—336 7 Claims



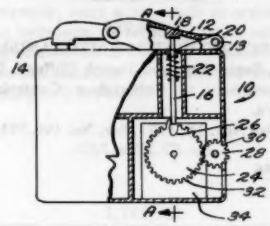

An apparatus for the continuous polygonal corrugation of hot sheets of thermoplastic material has continuous elements formed of metallic wires welded end-to-end. These elements are arranged in space at the locations where the sheets should normally be bent for producing the desired corrugation. The elements moving with the sheets during passage thereof through the apparatus.

3,744,953

## CIGARETTE LIGHTER WITH TIME LOCK

Harry C. Herr, 404 Willow Road, Savannah, Ga.

Filed Aug. 23, 1971, Ser. No. 174,119
Int. Cl. F23q 2/08, 2/32
U.S. Cl. 431—13 7 Claims




A time lock associated with a cigarette lighter can be set to deactivate the lighter for the set time. The time lock may be mechanically or electrically powered or powered by a combination of those forces. The time lock may operate to lock the cover of a first type lighter to the body thereof, it may prevent the depression of the flint striker lever in a second type lighter or it may, in either type of lighter, remove the compression force between the flint and the striker wheel. A counter may be associated with the time of the time lock to register the number of times the time lock is set and thus, indirectly the number of times the lighter was used.

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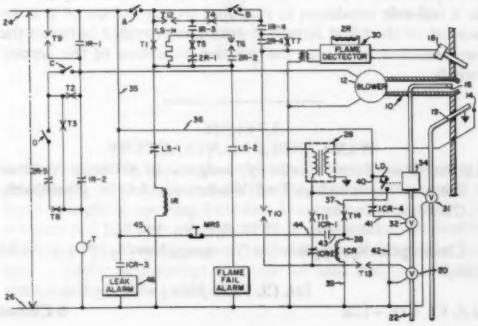
3,744,954

## FUEL-LEAK DETECTOR AND SAFETY SYSTEM

Edward A. Faulkner, 16 Brookfield Drive, Shelton, Conn.

Filed May 27, 1971, Ser. No. 147,421
Int. Cl. F23q 9/08
U.S. Cl. 431—16 15 Claims




A safety control system for detecting and stopping leakage of fuel through the fuel-valve in burner fully automatic installations subject to such leakage problems because of the presence of fuel under pressure at the fuel-valve for periods of time when the burner is not actually lighted. The system includes a lead-detector, such as a pressure switch, located downstream of the main fuel-valve for closing an auxiliary fuel-valve installed in tandem with the main valve, so that when leakage through the main valve occurs, the auxiliary valve closes and immediately stops the leak. It also trips a lockout circuit that prevents re-ignition of the burner. A discriminator device is employed for nullifying the action of the leak-detector on normal flow of fuel to the burner nozzle. While the leak safety of the present invention immediately stops the leak by closing the auxiliary fuel-valve, it permits the master burner control to progress through its normal cycle of operations during both its shut-down and start-up periods to the point just before ignition takes place, so that any fuel that

may have leaked will be purged during the purge periods of the burner cycle, thereby providing a safeguard against ignition of the leaked fuel when the burner is restarted. A leak alarm is provided to signal when the leak-detector senses a fuel leak, and a separate manual reset device is provided so that the burner cannot be restarted accidentally following what might be erroneously thought to be a routine flame-out.

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**3,744,955**

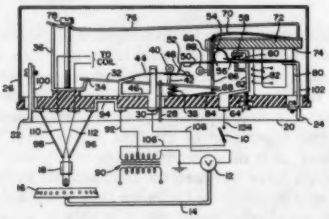
**ELECTRIC IGNITION MECHANISM**

**Hugh J. Tyler, Santa Ana, and Joseph Clifford, Corona, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed Nov. 15, 1971, Ser. No. 198,591**

**Int. Cl. F23n 5/00**

**U.S. Cl. 431—66** **10 Claims**



An electric ignition mechanism is disclosed for controlling a fuel burner system employing an electric ignitor having a positive temperature coefficient of resistance such that the current flow therethrough is dependent upon the temperature of the igniter. An electrical circuit, including a heat expansable wire in series with the ignitor and a coil in parallel with the ignitor, senses temperature responsive changes in the electrical characteristics of the ignitor. First and second switches are controlled by the wire and coil and are connected to control the operation of a fuel valve so that the system will be placed in a fail-safe condition in response to any failure of a component or electrical power. A spring is provided between the two switches to ensure the positive actuation of the second switch.

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**3,744,956**

**WAX CANDLE MANUFACTURE**

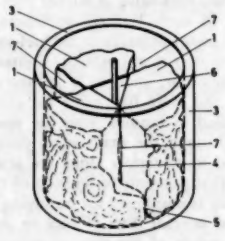
**Louise Hess, Bonn, Germany, assignor to Wilhelm Vollmar Bonner Wachshleiche Und Wachswarenfabrik, Rheinbach-Oberdress, Germany**

**Filed Nov. 2, 1971, Ser. No. 194,822**

**Claims priority, application Germany, Nov. 4, 1970, P 20 54 206.7**

**Int. Cl. F23d 3/16**

**U.S. Cl. 431—126** **6 Claims**



A decorative wax candle which includes initially separate wax inserts having colored sculptured relief surfaces that are directed outwardly toward the peripheral surface of the candle and which colored sculptured relief surfaces are visible through the outer peripheral surface of the candle.

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**3,744,957**

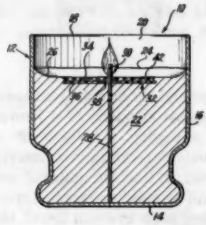
**DISPLAY CANDLE**

**Charles B. Wright, Sr., St. Louis, Mo., assignor to Penn Corporation, Princeton, N.J.**

**Filed Dec. 8, 1971, Ser. No. 205,963**

**Int. Cl. F23q 2/32**

**U.S. Cl. 431—126** **2 Claims**



Candle wax having the characteristic of opaqueness when solid and substantial transparency when melted is disposed in a receptacle, and a disc having indicia thereon is suspended in the candle wax about a wick whereby it is exposed when the heat from the burning wick melts the surrounding candle wax.

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**3,744,958**

**POCKET LIGHTER ACTUATED BY A PART OF THE HOUSING THEREOF**

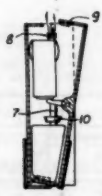
**Calus-Christian Cobarg, Steinback/Taunus, Germany, assignor to Braun A.G., Frankfurt/Main, Germany**

**Filed Mar. 30, 1970, Ser. No. 23,842**

**Claims priority, application Germany, Apr. 12, 1969, P 19 18 687.9**

**Int. Cl. F23d 13/04**

**U.S. Cl. 431—150** **9 Claims**



A lighter comprising a housing having two parts each with at least one narrow and one broad side, and a device to actuate the lighter to produce a lighter flame, the actuating device forming a substantial portion of at least one broad side and being tiltable about an axis extending in a direction substantially transverse to the major extension of such one housing part broad side.

3,744,959

## METHOD OF BURNING MOLDED CARBON BODIES IN ROUND-DOWN-DRAFT KILNS

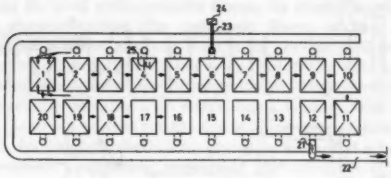
Erich Nedopil, Augsburg; Wilfried Krohe, Niederhochstadt, both of Germany, and Karl Wittmann, Bad Goisern-Reitern, Austria, assignors to Sigri Elektrophit GmbH, Meitingen near Augsburg, Germany

Filed Feb. 18, 1971, Ser. No. 116,534

Claims priority, application Germany, Feb. 21, 1970, P 20 08 206.8; Mar. 5, 1970, P 20 10 372.4

Int. Cl. F27b *13/02*

U.S. Cl. 432—12 10 Claims



A process for burning molded carbon bodies in round down-draft kilns, which comprises cooling at least one of the chambers ahead of the fire box by the introduction of cold gases or vapors.

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3,744,960

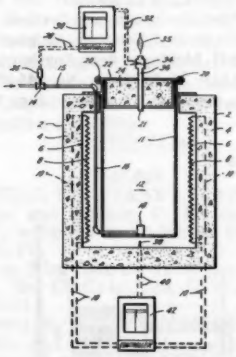
## FLUID ENVIRONMENT IN A TREATMENT ZONE

Glenn R. Ingels, 9940 Memorial Drive, Houston, Tex.

Continuation-in-part of Ser. No. 828,600, May 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 597,291, Nov. 28, 1966, abandoned, which is a continuation-in-part of Ser. No. 292,280, July 2, 1963, abandoned. This application May 8, 1972, Ser. No. 250,923

Int. Cl. F27b *9/16*

U.S. Cl. 432—23 16 Claims



The transfer of energy in a fluid environment in a treatment zone is closely controlled by carefully controlling the enthalpy of the incoming fluid environment and the enthalpy of the exhausting fluid environment. The enthalpy in the incoming fluid environment is controlled independently of the enthalpy of the treatment zone. The enthalpy in the exhausting fluid environment is controlled in response to the temperature of the exhausting fluid environment. Carbonaceous or inert material or both may be added to the fluid environment to control the temperature of the exhausting fluid environment. The fluid environment may be a saturated fluid mixture composed of liquid water saturated with a major amount of carbon dioxide, a minor amount of methane (which may be omitted), and lesser amounts of hydrogen and carbon monoxide at temperatures from about 32°F to about 160°F and at pressures up to the equilibrium pressure of water, 218.5 atmospheres. When using a saturated fluid mixture for the treatment environment, best results are obtained when the temperature of the exhausting environment is maintained within the range of about 212°F to about 1,500°F, the preferred ranges being for low water concentration mixtures from about 212°F to about 400°F and for higher water concentration mixtures from about 400°F to about 980°F. The method is applicable to other fluid environments, for example, inert gases, such as argon, or reducing gases, such as hydrogen, or nitriding gases, such as nitrogen, or carburizing gases, such as methane, or controlled fluid mixtures, such as endothermic or exothermic environments. A number of examples is set forth.

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3,744,961

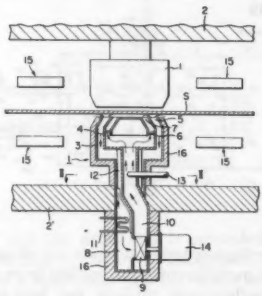
## STRIP FLOATING-APPARATUS

Isamu Eguchi, and Kazuo Akama, both of Aichi-ken, Japan, assignors to Daido Steel Co., Ltd., Ninami-ku, Nagoya-shi, Aichi-ken, Japan

Filed Apr. 13, 1972, Ser. No. 243,628

Int. Cl. F27b *9/28*

U.S. Cl. 432—59 4 Claims



A strip-floating apparatus, wherein an inner casing having a jet opening on its end is installed inside an outer casing so as to form a suction opening between the both casings, said jet opening and suction opening are interconnected connected by means of a gas flow passage provided with a recirculating fan, and a cooler is installed this side of said recirculating fan within said gas flow passage.

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3,744,962

## APPARATUS FOR FIRING OR SINTERING FINE MATERIAL

Horst Ritzmann, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Sept. 9, 1971, Ser. No. 178,901

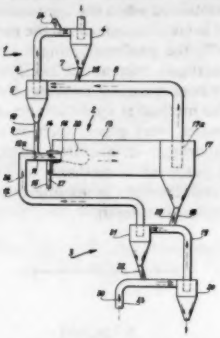
Claims priority, application Germany, Dec. 16, 1970, P 20 61 980.1

Int. Cl. F27b *9/38*

U.S. Cl. 432—58 3 Claims

The apparatus comprises a firing or sintering chamber followed by a fine material separator. Material from a fine material preheater and air form an air preheater are introduced into a premixing chamber, A connection is provided for introducing a mixture of preheated fine material and air

from the premixing chamber into the firing or sintering chamber, and fuel is introduced in a flow which is substantial-



by coaxial with the flow of air and fine material, to cause the fuel to burn in the air and to heat the fine material.

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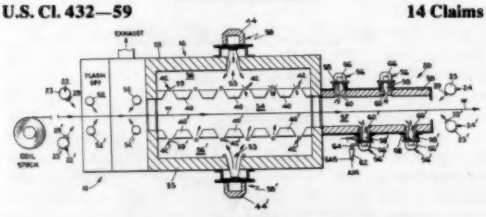
**3,744,963**
**HEAT TREATMENT**
**Charles S. Flynn, Muskegon, Mich., assignor to National Lumberman's Bank & Trust Company, as Trustee for Blu-Surf Thermo Engineering Trust, Muskegon, Mich.**
**Filed Nov. 19, 1971, Ser. No. 200,295**
**Int. Cl. F27b** *9/28*
**U.S. Cl. 432—59** **14 Claims**



Apparatus for high-speed heat treatment of web stock, particularly coated metallic stock as supplied from a coil, moved in catenary configuration through the heat-treatment apparatus. The apparatus employs a plurality of high-velocity, combustion burner assemblies specially arranged in a plurality of heating zones through which the strip is moved. A plurality of heating sections using these burners usually includes a high-velocity section and a dynamic flow section. Frequently included is a flash-off section to remove volatiles. Special air curtains at the ends of the apparatus serve to close the entry and exit and also remove the cold incoming boundary layer from the stock thereby allowing more efficient operation, and the hot outgoing boundary layer to assure rapid cooling.

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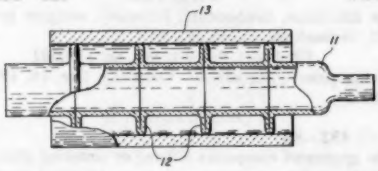
**3,744,964**
**HIGH TEMPERATURE DIFFUSION TUBE**
**Melvin Gory Hart, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed May 28, 1971, Ser. No. 147,948**
**Int. Cl. F27b** *5/00*
**U.S. Cl. 432—120** **4 Claims**



A quartz tube designed for use at temperature in excess of 1,200° C. is provided with a plurality of external reinforcing ribs integral with the tubular body member.

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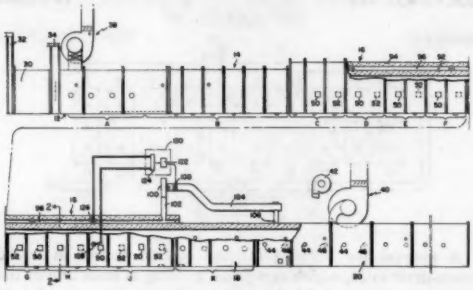
**3,744,965**
**TUNNEL KILN**
**George Bickley Remmey, Huntingdon Valley, Pa., and Charles A. McFadden, Medford, N.J., assignors to Bickley Furnace Incorporated, Bucks County, Pa.**
**Filed Nov. 29, 1971, Ser. No. 202,893**
**Int. Cl. F27b** *9/00*
**U.S. Cl. 432—137** **16 Claims**



A tunnel kiln in which the roof of the heating zone of the kiln is made in the form of a double arch arrangement providing a plenum chamber for preheating combustion air for the burner means. Air is supplied to the air preheat chamber from the cooling zone of the kiln and is delivered from the air preheat chamber to the burner means to provide combustion air therefor.

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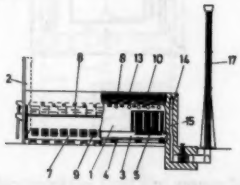
**3,744,966**
**SINGLE-CHAMBER KILN WITH COMBUSTION GAS CIRCULATION**
**Wilfried Krohe, Niederhochstadt, and Berthold Rosch, Frankfurt-Schwanheim, both of Germany, assignors to Sigri Elektrographit GmbH, Meitingen near Augsburg, Germany**
**Filed May 26, 1971, Ser. No. 146,890**
**Claims priority, application Germany, June 18, 1971, P 20 29 840.2**
**Int. Cl. F27b** *3/02*
**U.S. Cl. 432—176** **8 Claims**



A single chamber kiln for firing ceramic bodies, such as molded carbon bodies and the like, with combustion gas, includes a kiln having side walls and defining a chamber for receiving the ceramic bodies. Hydrocarbon fuel burners are arranged in the walls in a first plane for supplying the combustion gas to the chamber and gas outlets are disposed in the walls and directed into the chamber. Substantially vertical passages join the outlets and blowers are arranged in the walls at a second plane and communicate with these passages for moving combustion gas therethrough to circulate the same through the chamber.

3,744,967

## PROCESS FOR DYEING NAPPED FABRICS OF WATER SWELLABLE CELLULOSE FIBERS

John Stanley Thackrah, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1971, Ser. No. 127,035
Int. Cl. D06p *3/60*
U.S. Cl. 8—54.2 7 Claims

An improved process for dyeing napped fabrics comprising water swellable cellulosic fibers, for example cotton fibers, alone or blended with synthetic fibers, for example polyester fibers, by contacting the cellulosic fibers of the fabric throughout with an aqueous solvent- or solvent solution of a preformed disperse dye of low water solubility, said solvent consisting of ethylene glycol or a derivative thereof which is at least partially miscible with water, has a boiling point above 150°C., and is a solvent for the dye at some temperature up to 225°C., for example diethylene glycol monomethyl ether, the improvement comprising contacting the cellulosic fibers of the napped fabric with water, preformed disperse dye and solvent, removing a substantial part of the water by drying, overspraying the fibers after said removal of water with a water-solvent mixture, heating until the cellulosic fibers are contacted throughout with a solution of the dye, and thereafter fixing the dye and recovering napped fabric having the water swellable cellulosic fibers dyed throughout.

3,744,968

## METHOD OF RENDERING POLYOLEFINS DYEABLE WITH ANIONIC DYES

Ronald W. Fuest, Kinnelon Borough, N.J., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,086
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 D 20 Claims

The present invention relates to a method of selectively controlling the degree of dyeability of shaped articles produced from fiber-forming compositions of matter comprising a polyolefin and a minor amount of an alkyl or aralkyl amine-containing polymer, which method comprises either (1) treating said shaped articles with a weak-acid anionic surfactant to enhance dyeability, or (2) treating said shaped article with a strong-acid anionic surfactant to inhibit dyeability.

3,744,969

## BREAK RESISTANT LEATHER

Hugo A. Alps and William C. Prentiss, Huntingdon Valley, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

No Drawing. Filed June 9, 1970, Ser. No. 44,880
Int. Cl. C14c *3/22, 11/00*
U.S. Cl. 8—94.21 14 Claims

Mineral-tanned leather can be provided with improved break properties and improved dyeing characteristics by the impregnation thereof with certain novel polyampholyte resins.

3,744,970

## TREATING OF CELLULOSIC FIBER-CONTAINING MATERIAL TO IMPART FLAME-RETARDANCY THERETO

Ronald Swidler and William A. Sanderson, Pasadena, Jose P. Gamarra, La Palma, and William A. Mueller, Pasadena, Calif., assignors to Cotton, Incorporated, Memphis, Tenn.

No Drawing. Filed June 12, 1969, Ser. No. 832,817
Int. Cl. D06m *13/28;* C09k *3/28*
U.S. Cl. 8—183 MP 5 Claims

Materials such as cellulosic textile materials are made flame-retardant by treating them with compounds containing methylol groups, nitrogen and phosphorus. Typical such compounds have at least one radical of the formula:

$$>N-CH_2-\overset{O}{\overset{\|}{P}}(OR^5)_2$$

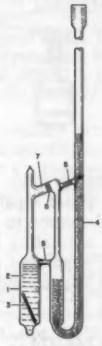
wherein $R^5$ is lower alkyl. Typical such compounds also have >NH groups and/or aminomethylol groups of the formula $>NCH_2OH$.

3744,971

## FUEL-METAL COMPATIBILITY TEST UNIT

Vernon A. Lamb, Royal, Iowa, Wahling H. Ng, Rockaway, N.J., and John P. Young, Gaithersburg, Md., assignors to the United States of America as representedd by the Secretary of the Army

Filed May 28, 1971, Ser. No. 148,063
Int. Cl. G01n *31/10, 33/22*
U.S. Cl. 23—230 R 7 Claims



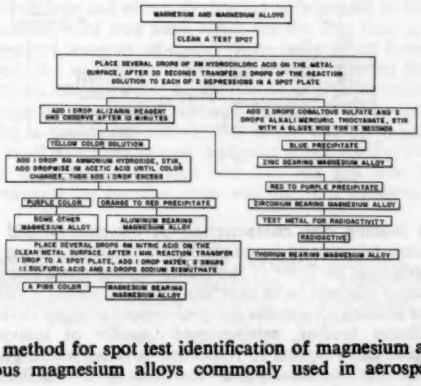
A method and test apparatus is presented which measures gas produced by catalytic decomposition or chemical reaction of a hydrazine-type fuel and a metal specimen.

3,744,972

## NONDESTRUCTIVE SPOT TEST METHOD FOR MAGNESIUM AND MAGNESIUM ALLOYS

Maywood L. Wilson, Tabb, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 16, 1971, Ser. No. 163,152
Int. Cl. G01n *33/20, 21/06*
U.S. Cl. 23—230 R 7 Claims


MAGNESIUM AND MAGNESIUM ALLOYS
CLEAN A TEST SPOT
PLACE SEVERAL DROPS OF 3N HYDROCHLORIC ACID ON THE METAL SURFACE, AFTER 30 SECONDS TRANSFER 2 DROPS OF THE REACTION SOLUTION TO EACH OF 2 DEPRESSIONS IN A SPOT PLATE
ADD 1 DROP ALIZARIN REAGENT AND OBSERVE AFTER 10 MINUTES
ADD 2 DROPS COBALTOUS SULFATE AND 2 DROPS ALKALI MERCURIC THIOCYANATE, STIR WITH A GLASS ROD FOR 15 SECONDS
YELLOW COLOR SOLUTION
BLUE PRECIPITATE
ADD 1 DROP 6N AMMONIUM HYDROXIDE, STIR, ADD DROPWISE 1N ACETIC ACID UNTIL COLOR CHANGES, THEN ADD 1 DROP EXCESS
ZINC BEARING MAGNESIUM ALLOY
RED TO PURPLE PRECIPITATE
PURPLE COLOR
ORANGE TO RED PRECIPITATE
ZIRCONIUM BEARING MAGNESIUM ALLOY
SOME OTHER MAGNESIUM ALLOY
ALUMINUM BEARING MAGNESIUM ALLOY
TEST METAL FOR RADIOACTIVITY
RADIOACTIVE
PLACE SEVERAL DROPS 6N NITRIC ACID ON THE CLEAN METAL SURFACE, AFTER 1 MIN. REACTION TRANSFER 1 DROP TO A SPOT PLATE, ADD 1 DROP WATER, 2 DROPS 1N SULFURIC ACID AND 2 DROPS SODIUM BISMUTHATE
THORIUM BEARING MAGNESIUM ALLOY
A PINK COLOR
MAGNESIUM BEARING MAGNESIUM ALLOY

A method for spot test identification of magnesium and various magnesium alloys commonly used in aerospace

applications. The spot test identification involves color codes obtained when several drops of 3 M hydrochloric acid are placed on the surface to be tested, and after approximately thirty seconds, two drops of this reacted acid transferred to each of two depressions in a spot plate for additions of other chemicals with subsequent color changes indicating magnesium or the alloy thereof.

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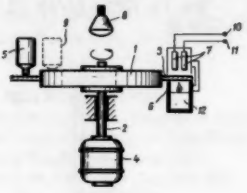
**3,744,973**
**CHROMATOGRAPHIC DETECTION APPARATUS**
**Hanniel Dubsky, Brno, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia**
**Filed Aug. 11, 1971, Ser. No. 170,759**
**Claims priority, application Czechoslovakia, Aug. 11, 1970, 5,580/70**
**Int. Cl. G01n** *31/12*
**U.S. Cl. 23—254 EF** **9 Claims**



Apparatus for chromatographic detection including means for transferring a phase separated in a chromatographic column from said column to a detector; the transferring means comprises a rotating body with a collecting surface receiving the separated phase from the column and conveying it to the detector for evaluation.

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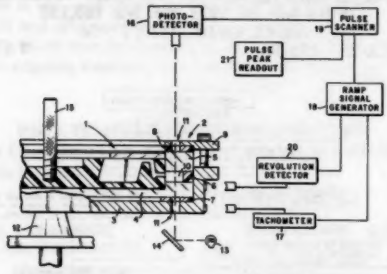
**3,744,974**
**LOADING DISK FOR PHOTOMETRIC ANALYZER OF ROTARY CUVETTE TYPE**
**Wayne L. Maddox, Oak Ridge, Tenn., Robert L. Coleman, Boston, Mass., and Wilbur D. Shults II, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission**
**Filed Nov. 30, 1971, Ser. No. 203,248**
**Int. Cl. G01n** *1/10, 21/00;* **B04b** *5/12*
**U.S. Cl. 23—259** **5 Claims**




A loading disk characterized by extremely rapid and efficient mixing and liquid transfer is provided for use in a photometric analyzer of the rotary cuvette type. The disk, which is adapted to be centrally disposed within a cuvette rotor housing an annular array of sample analysis cuvettes, facilitates loading, mixing, and transfer of individual samples and reagents to respective cuvettes where photometric analysis takes place. The loading disk defines an annular array of sample and reagent chambers or cavities with one pair of adjacent chambers being provided to supply each respective sample analysis cuvette. Each pair of chambers is adapted to receive and retain separate volumes of sample and reagent liquids when the loading disk and cuvette rotor are stationary and to discharge the liquids when the loading disk and rotor are rotated. Mixing chambers, one for each pair of sample and reagent chambers, are disposed radially outward from the sample and reagent chambers on radii positioned angularly intermediate the chambers in each respective pair of chambers. First passageways connect, in parallel, the sample and reagent chambers in each pair of chambers to corresponding mixing chambers. Second passageways provide discharge means from the mixing chambers to respective cuvettes. Rotation of the loading disk and cuvette rotor causes the liquids in each pair of sample and reagent chambers to flow in parallel from those chambers, through the first passageways to the mixing chambers where they are mixed, and then through the second passageways to respective sample analysis cuvettes for photometric analysis.

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**3,744,975**
**ROTOR FOR MULTISTATION PHOTOMETRIC ANALYZER**
**James C. Mailen, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission**
**Filed Dec. 9, 1971, Ser. No. 206,468**
**Int. Cl. G01n** *1/10, 21/00, 33/16;* **B04b** *5/12*
**U.S. Cl. 23—259** **9 Claims**

An improved rotor for a multistation photometric analyzer which is capable of operation without gravitational assistance to effect transfer or retention of liquids. The rotor comprises a laminated disk-shaped member with a central opaque disk sandwiched between outer transparent disks. The central disk is provided with a circular array of axially extending apertures which form sample analysis cuvettes when that disk is sandwiched between the outer transparent disks. Central loading ports extend through each outer transparent disk in register with respective distribution chambers formed in the opposing end faces of the central disk. Passageways extend from each distribution chamber to each sample analysis cuvette for adding sample and reagent liquids to the sample analysis cuvettes. Means are provided for uniformly distributing sample and reagent liquids to the sample analysis cuvettes while the rotor is in operation.

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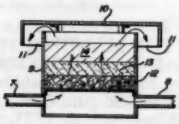
**3,744,976**
**VENTING DEVICE**
**Thomas O. Tongue, Baltimore, Md., assignor to W. R. Grace & Co.**
**Filed Nov. 23, 1970, Ser. No. 91,910**
**Int. Cl. B01d** *39/00, 46/00;* **C01f** *7/58*
**U.S. Cl. 23—260** **8 Claims**

This invention concerns a device which, in combination with a secondary condenser system, effectively removes particulate matter and noxious noncondensible fumes such as chlorine gas from an air stream mixture. In one embodiment, it comprises a pressure compensating secondary condenser which is vented into a chamber having a glass wool or similar fibrous layer and an adsorbent

or reactive material layer, this second layer removing the noxious gas from the gas-air stream. In a particular embodiment, this device is used in the venting of aluminum chloride condensers to the atmosphere, with the adsorbent or reactive layer being preferably a flake caustic.



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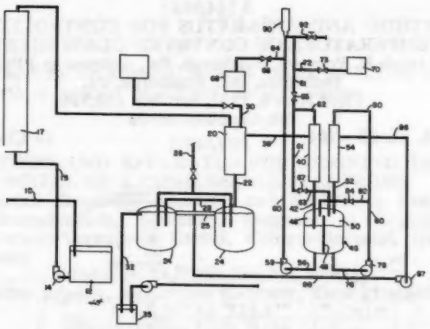
3,744,977

**APPARATUS FOR TREATING CYANIDE WASTES**

Lewis F. Scott, Indianapolis, Ind., assignor of a fractional part interest to Franke Plating Works, Inc., Fort Wayne, Ind.

Original application Feb. 17, 1969, Ser. No. 799,609, now Patent No. 3,592,586, dated July 13, 1971. Divided and this application Mar. 5, 1971, Ser. No. 121,310
Int. Cl. B01j *1/00*; C01c *3/10*
U.S. Cl. 23—260 5 Claims



An apparatus for converting cyanide wastes into sodium cyanide in which a heat exchanger is interconnected between a plurality of reaction tanks and a first tower adapted to hold a charge of sodium hydroxide. Said tower is interconnected to one compartment of a chambered tank, and a second compartment in said tank is connected to a second tower adapted to hold a charge of sodium hydroxide. A pumping assembly is provided for withdrawing the sodium cyanide from the first compartment and for recycling the reaction mixture through the towers and the compartmented tank.

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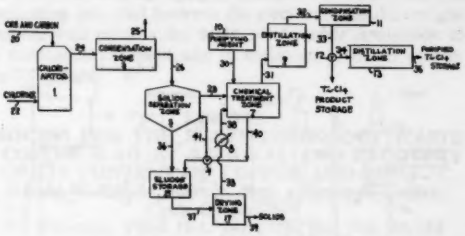
3,744,978

**BENEFICIATION OF TITANIUM TETRACHLORIDE PURIFICATION SLUDGE SOLIDS**

William C. Pefferman, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 8, 1971, Ser. No. 105,034
Int. Cl. B01d *21/00*; C01g *23/02*
U.S. Cl. 23—293 R 11 Claims

The production of titanium tetrachloride by chlorination of titaniferous ore is described. The sludge resulting from chemical purification of crude titanium tetrachloride is concentrated by recycling such sludge to a solids separation zone utilized to separate solids from impure titanium tetrachloride condensate and removing the combined solids from said zone.



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3,744,979

**METHOD OF FORMING A HARD SURFACE ON CEMENTED CARBIDES AND RESULTING ARTICLE**

Herbert S. Kalish, Short Hills, N.J., assignor to Adamas Carbide Corporation, Kenilworth, N.J.

No Drawing. Filed Apr. 14, 1971, Ser. No. 134,042
Int. Cl. B22f *3/24*, *7/02*
U.S. Cl. 29—182.2 14 Claims

Cemented carbide cutters are treated with boron carbide and hydride of a reactive or refractory metal at temperatures above 500° C. This process hardens the surface of the cutter and decreases wear in machining of various metals.

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3,744,980

**METHOD FOR MAKING ARTIFICIAL FUEL FROM PAPER AND PRODUCT**

Fritz B. Harris, 15840 Lancaster Road, Los Gatos, Calif. 94030

Filed Oct. 28, 1970, Ser. No. 84,828
Int. Cl. C10l *9/00*, *5/36*
U.S. Cl. 44—1 R 9 Claims

The method of this invention provides the following steps: Dry, ground paper of all sorts is placed in a basket type porous container, which container is the shape of the ultimate product. While in the container the loose ground paper particles put under compression which is very slight, not more than 6 or 7 p.s.i. to condense them slightly. The container with the dry paper particles is then dipped in hot liquid wax or otherwise coated by hot liquid wax and remains under this treatment to secure the depth of penetration or absorption required to provide the desired length of burning time. The greater the depth of penetration the longer the burning time. The filled porous container is then removed from the treatment of the hot liquid wax and either air dried or refrigerated to form a relatively hard wax shell which for the first time gives the product integrity of form. When integrity of form is assured, the wax surfaced product is then removed from the porous container and is ready for sale and distribution. Amongst the unexpected results is, that when the wax outer coating is ignited the melting wax is hot enough to penetrate in all directions toward the center where loose ground paper is progressive treated with hot wax and thus further extends the burning cycle and makes it uniform.

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3,744,981

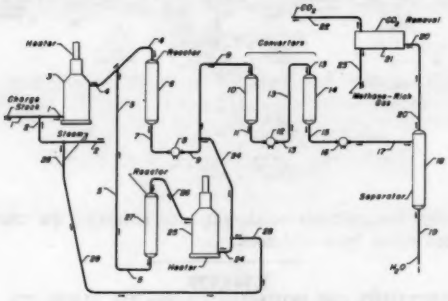
**STEAM REFORMING OF HYDROCARBONS**

Dennis J. Ward, South Barrington, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 26, 1971, Ser. No. 137,495
Int. Cl. C01b *2/14*
U.S. Cl. 48—214 11 Claims

Steam reforming is effected to produce a methane-rich gaseous product, suited for use as a synthetic natural

gas, from higher-boiling hydrocarbons. A portion of the initial reaction zone product effluent, generally from 3.0 mol percent to about 50.0 mol percent is reacted in a



second reaction zone at hydrogen-producing conditions; the product therefrom is recycled to the initial reaction zone.

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**3,744,982**

**METHOD OF MAKING BORON-ALLOYED DIAMOND COMPACTS AND BERYLLIUM-ALLOYED CUBIC BORON NITRIDE COMPACTS**

**Harold P. Bovenkerk, Worthington, Ohio, and Glenn T. Malloy, Andover, Mass., assignors to General Electric Company**

**No Drawing. Filed May 20, 1971, Ser. No. 145,517**
**Int. Cl. B24d *3/02***
**U.S. Cl. 51—307** **3 Claims**

Diamond compact and cubic boron nitride compact, and mixtures thereof, having electrical resistivity of less than 10 ohm-cm. are formed my mixing finely divided boron-alloyed synthetic diamond or cubic boron nitride, or mixtures thereof, with one-half to twenty overall weight percent of titanium diboride powder or zirconium diboride powder, or mixtures thereof, and subjecting the mixture to a temperature of at least 1300° C. in the cubic-stable region of appropriate hexagonal-cubic phase diagram.

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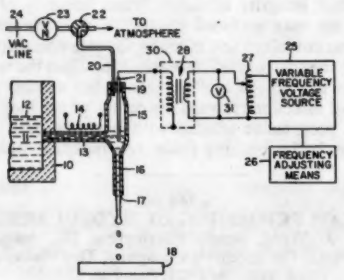
**3,744,983**

**APPARATUS AND METHOD FOR FORMING SPHERES FROM MOLTEN FUSIBLE MATERIAL**

**Weston H. Jenkins, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Aug. 19, 1971, Ser. No. 172,988**
**Int. Cl. C03b *19/10***
**U.S. Cl. 65—21** **12 Claims**




A method and apparatus are disclosed for forming sized spheres or beads of a fusible material such as glass. A voltage of proper amplitude and frequency, which is applied to a stream of molten material issuing from an orifice, acts as a perturbation on the stream and accelerates the formation of drops therefrom. The drops form spheres under the influence of surface tension, and the spheres are collected in a conventional manner.

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**3,744,984**

**PROCESS FOR THE MANUFACTURE OF FOAMED PORCELAIN-LIKE SHAPED ARTICLES**

**Osamu Sato, 3351 Oaza Hoshida, Katano-cho, Kitakawachi-gun, Osaka, Japan**

**No Drawing. Filed Apr. 5, 1971, Ser. No. 131,507**
**Int. Cl. C03c *3/04***
**U.S. Cl. 65—22** **18 Claims**

A process for the manufacture of foamed porcelain-like shaped articles which comprises mixing (A) at least one aggregate component selected from the group consisting of the silicate glass powders and silicate mineral powders; (B) a water glass component; (C) an inorganic alkali salt component which generates a gas by substantially decomposing at the firing temperature; and (D) a component for adjusting the foaming temperature, said component being selected from at least one mineral powder selected from the group consisting of boric acid, borates, lead oxides and zinc white, and at least one mineral powder selected from the group consisting of the alumina compounds, magnesia compounds and calcium compounds; molding the resulting mixture; and thereafter firing and foaming the resulting shaped article at a temperature ranging between 700° and 1200° C.

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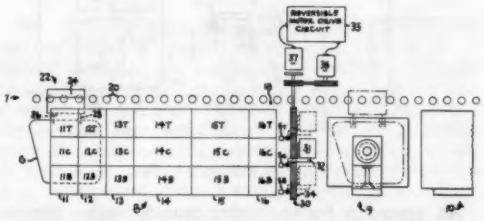
**3,744,985**

**METHOD AND APPARATUS FOR CONTROLLING TEMPERATURE OF CONVEYED GLASS SHEETS**

**Jacob R. Peternel, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed June 8, 1971, Ser. No. 150,986**
**Int. Cl. C03b *23/02***
**U.S. Cl. 65—104** **10 Claims**



A novel arrangement for controlling the thermal gradient of glass sheets undergoing thermal processing where temperature is a critical feature of the operation such as in shaping, tempering, coating, and the like.

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**3,744,986**

**METHOD FOR THE PRODUCTION OF HORTICULTURAL SOILS**

**Ehrenfried Grosse-Brauckmann, Bonn, Herman Kick, Rottgen, and Gottfried Nettesheim, Wesseling, Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, near Cologne, Germany**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 850,230, Aug. 14, 1969. This application Sept. 28, 1971, Ser. No. 184,632**
**Int. Cl. C05f *11/02***
**U.S. Cl. 71—24** **3 Claims**

Production of horticultural soils which give faster and stronger growth of flowers and vegetables by mixing lignite and peat in the ratio of 0.7–1.5 to 1 and adding organic fertilizer compounds.

3,744,987

## COATING METHOD OF FERTILIZER

Yoshihiko Omura and Eizaburo Watanabe, Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 705,272, Feb. 14, 1968. This application Oct. 21, 1970, Ser. No. 82,481
Claims priority, application Japan, Feb. 20, 1967, 42/10,470
Int. Cl. C05g *3/04*
U.S. Cl. 71—64 F 7 Claims

A coated granular fertilizer is manufactured by coating a solid fertilizer with a coating preparation which comprises a water-soluble resol type phenol resin having water tolerance of one or greater, an organic acid having a dissociation constant not exceeding $2\times10^{-4}$ and a filler such as talc and then harden the coating composition by heating at 100–130° C.

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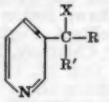
3,744,988

## TOBACCO SUCKER CONTROL

Eriks V. Krumkalns and Harold Melton Taylor, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Application Oct. 16, 1969, Ser. No. 867,058, which is a continuation-in-part of application Ser. No. 785,737, Dec. 20, 1968, now abandoned. Divided and this application Dec. 23, 1971, Ser. No. 211,691
Int. Cl. A01n *5/00*
U.S. Cl. 71—78 11 Claims

Substituted 3-pyridylmethanes having the formula



are applied to growing tobacco plants to inhibit the growth of laterals, or suckers, on such plants.

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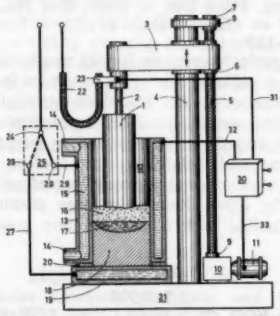
3,744,989

## METHOD AND APPARATUS FOR REFINING THE METAL OF A CONSUMABLE ELECTRODE

Christian Doenecke, Rossdorf, and Karl-Georg Redel, Oberrodenbach, Germany, assignors to Leybold-Heraeus-Verwaltung GmbH, Cologne-Bayental, Germany

Filed Nov. 18, 1970, Ser. No. 90,581
Claims priority, application Germany, Dec. 11, 1969, P 19 62 135.3
Int. Cl. C22d *7/00*; H05b *7/18*
U.S. Cl. 75—10 R 5 Claims



In a consumable electrode furnace in which an electrode partly immersed in a slag layer is gradually melted by current passing through the slag to a conductive crucible receiving the slag and the electrode, and an ingot of refined metal collects at the crucible bottom, the bottom wall and upright wall of the crucible are electrically insulated from each other, thereby permitting current to be passed during start-up between the electrode and the bottom wall, and thereafter in a predominantly horizontal path between the electrode and the upright crucible wall. The resulting fluctuating potential between the electrode and the upright crucible wall permits the depth of electrode immersion to be controlled automatically to maintain optimum operating conditions.

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3,744,990

## PROCESS FOR THE BENEFICIATION OF WASTE COPPER SLAG BY REMOVAL AND RECOVERY OF ITS CONTENT OF COPPER AND ZINC

Harold W. Wilson, El Paso, Tex., assignor to Golden Cycle Corporation

No Drawing. Filed Oct. 14, 1970, Ser. No. 80,754
Int. Cl. C22b *7/04, 3/00, 15/10*
U.S. Cl. 75—24 13 Claims

A process for beneficiation of waste copper slag to be used for the entrapment of sulfur dioxide from waste gases by contacting the waste slag with an aqueous solution of ammonia gas to remove the reactive copper content, and zinc content, if any present in the waste slag. The removal of the copper by the aqueous ammonia solution is accomplished without the presence of any dissolved ammonium salts or the addition of air or other oxidizing agent to the reaction. After dissolving the copper values and zinc values, if desired, they may be recovered from the ammonia gas solution by displacement.

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3,744,991

## ACCELERATION OF THE DISSOLUTION OF LIME IN THE BASIC OXYGEN FURNACE PROCESS

Clifford J. Lewis and Richard S. Bruski, Lakewood, Colo., assignors to Flintkote International Licensing Company, White Plains, N.Y.

Application Aug. 20, 1969, Ser. No. 859,237, now Patent No. 3,574,597, dated Apr. 13, 1971, which is a continuation-in-part of abandoned application Ser. No. 611,277, Jan. 24, 1967. Divided and this application Oct. 6, 1970, Ser. No. 78,576
Int. Cl. C21c *7/00*
U.S. Cl. 75—53 9 Claims

The rate of dissolution of lime in the slag of a basic oxygen steelmaking furnace is accelerated, and slag control is enhanced, by charging lime to the slag in the presence of a boron-containing compound, particularly one that yields an oxide of boron, especially $B_2O_3$, under the operating conditions prevailing in the basic oxygen furnace. Illustrative of such boron-containing compounds used as additives with the lime are boron trioxide, boric acid, anhydrous sodium tetraborate, calcium metaborate, calcined and uncalcined colemanite and rasorite. The additive preferably is delivered to the slag either in intimate mixture with the lime or separately but substantially simultaneously with the lime.

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3,744,992

## METHOD FOR CONVERTING COPPER

Sven Anders Lundquist, Skelleftehamn, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

No Drawing. Filed Nov. 30, 1970, Ser. No. 93,914
Claims priority, application Sweden, Dec. 23, 1969, 17,828/69
Int. Cl. C22b *15/14*
U.S. Cl. 75—76 5 Claims

A method for removing antimony from a material which comprises at least one of the substances copper and copper sulphide. Oxidizable iron or oxidizable iron compounds are added to the material while this is in a molten condition, the said oxidizable iron or compound being of a type which are soluble in molten copper or copper sulphide and which have a low antimony content. The dissolved iron is then isolated from the melt by a partial oxidation process, simultaneously oxidizing antimony and binding the same to the iron oxide.

3,744,993
**POWDER METALLURGY PROCESS**
Robert E. Matt, Citrus Heights, and Alan V. Levy, Sacramento, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
No Drawing. Continuation-in-part of application Ser. No. 742,194, July 3, 1968, which is a continuation-in-part of application Ser. No. 657,087, July 31, 1967, now abandoned. This application Nov. 30, 1970, Ser. No. 93,810
Int. Cl. B22f *1/00*
U.S. Cl. 75—213 35 Claims

A method of producing an improved tool steel having a superior alloy homogeneity which comprises the steps of providing a charge of irregularly-shaped, fractured, prealloyed tool steel powder of a homogeneous composition, exposing the powdered particles to a hydrogen reducing atmosphere to reduce the oxide content and slowly cooling the reduced powder particles to avoid imparting an objectionable degree of hardness which would interfere with subsequent cold pressing of reduced powder particles, cold pressing the reduced powder particles to a billet form having a green strength adequate to maintain structural integrity upon further handling of the billet, and sintering the cold pressed billet to impart a theoretical density of at least 85% to the tool steel with the sintering being carried on under conditions to minimize grain growth and phase separation of a degree insensitive to subsequent processing.

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3,744,994
**METHOD OF SEPARATING COPPER FROM NICKEL**
Klaus Emicke and Wilhelm Goralczyk, Hamburg, Germany, assignors to Norddeutsche Affinerie, Hamburg, Germany
No Drawing. Continuation-in-part of application Ser. No. 70,508, Sept. 8, 1970. This application Dec. 30, 1970, Ser. No. 102,941
Claims priority, application Germany, Sept. 19, 1969, P 19 47 535.5
Int. Cl. C22b *15/08, 23/04*
U.S. Cl. 75—101 R 4 Claims

A process for recovering copper and nickel from compositions containing copper and nickel in the presence of sulfidic sulfur in which the composition, which must have sulfur in an amount of at least 20% by weight of the copper content or which contains at least 50% by weight nickel, is slurried with sulfuric acid having a $H_2SO_4$ concentration of 400–800 g./liter, is heated to a temperature of 110° to 120° C., and is permitted to stand at this temperature until the metal (nickel) which forms unstable sulfates in sulfuric acid are converted into sulfates. The solid and liquid phases are then separated and treated separately for recovery of the metal.

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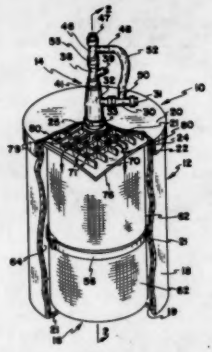
3,744,995
**SILVER RECOVERY**
Byron R. MacKay, 2952 Robidoux Road, Sandy, Utah 84070
Original application Mar. 9, 1970, Ser. No. 17,836, now Patent No. 3,630,505, dated Dec. 28, 1971. Divided and this application Nov. 3, 1971, Ser. No. 195,425
Int. Cl. C22b *3/00*
U.S. Cl. 75—109 1 Claim

Equipment and methods for recovering silver from a silver-containing solution. The equipment comprises a container and a connector having an influent liquid passage and an effluent liquid passage. A recovery element made of a metal above silver in the electromotive force series fits within the container to form an electrolytic cell. The metal forming the element is arranged in a woven matrix, such as, for example, galvanized window screen, which is wound around its axis which is common with the axis of the container to form a hollow cylinder having an inside surface and an outside surface and which is pervious only transversely in respect to the container. One of the passages is in liquid communication with the inside surface of the element, and the other passage is in liquid



communication with the outside surface of the element. The solution precipitates silver in exchange for the metal of the woven matrix, without clogging of the cell.

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3,744,996
**NICKEL BASE ALLOYS OF IMPROVED HIGH TEMPERATURE TENSILE DUCTILITY**
Stuart Walter Ker Shaw, Sutton Coldfield, and Paul Isidore Fontaine, Solihull, England, assignors to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed Oct. 27, 1970, Ser. No. 84,529
Claims priority, application Great Britain, Oct. 28, 1969, 52,821/69
Int. Cl. C22c *19/00*
U.S. Cl. 75—122.5 6 Claims

The tensile ductility of low chromium substantially precipitation hardened nickel-base alloys within the temperature range of 600° C. to 900° C. is improved through the incorporation in the alloys of controlled amounts of thorium and/or cerium.

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3,744,997
**METALLURGICAL GRAIN REFINEMENT PROCESS**
Lawrence A. Deimen, Ann Arbor, Mich., assignor of a fractional part interest to James M. Deimen, Pickney, Mich.
No Drawing. Filed Oct. 6, 1969, Ser. No. 864,192
Int. Cl. B22d *27/16*
U.S. Cl. 75—129 28 Claims

A widely applicable process for the production of metal castings with a uniform fine grain structure in the as-cast condition is disclosed. An inoculant containing at least two constituents, one for localized depression of the alloy freezing point and the other for seeding purposes is used in combination with relatively slow cooling to provide a controlled constitutional supercooling effect during the freezing of the alloy. Relatively large castings in sand molds are possible with a uniform fine grain structure throughout.

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3,744,998
**ADDITIVES FOR CONTROLLING THE PHYSICAL AND STRUCTURAL CHARACTERISTICS OF CAST IRON**
Domingos Loricchio, Sao Paulo, Brazil, assignor to The Carborundum Company, Niagara, Falls, N.Y.
No Drawing. Filed Feb. 16, 1971, Ser. No. 115,695
Int. Cl. C22c *37/02, 37/04*
U.S. Cl. 75—130 R 9 Claims

Compositions or mixtures of silicon carbide, columbite (a mineral of the niobium-iron tantalate group) as well

as other substances such as chromite, thixotropic and surface-active ingredients have been added to effect the hardness and textural or structural homogeneity of cast iron and ferrous alloys. Silicon carbide and baddeleyite (a mineral of zirconium dioxide, found at Caldas, Minas Gerais, Brazil) pelleted with other materials has also been found useful as an additive to cast iron. Another additive is formed of silicon carbide and a nodulizing (spherulizing) agent, particularly with metallic magnesium pelleted with additional substances, such as thixotropic and surface active agents.

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**3,744,999**

## COMPOSITE FERROPHOSPHORUS COMPOSITION

**Milton J. Scott, St. Louis, Harry M. Stevens, Ballwin, and Hans-Jurgen A. Stenzel, Brentwood, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed Mar. 10, 1970, Ser. No. 18,317**

**Int. Cl. C21c *7/00*; C22b *9/08*; C22c *33/00***

**U.S. Cl. 75—132** **10 Claims**

Ferrophosphorus containing at least 1% silicon by weight is admixed with an oxidizing agent and formed into an integral composite, the silicon content of which is converted to silica upon addition of the composite to molten iron, steel, or alloys thereof. The composite provides a useful effective low silicon source of phosphorus for iron, steel and their alloys.

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**3,745,000**

## PROCESS FOR PRODUCING TUNGSTEN-ALLOY EMITTER TYPE ELECTRODE

**Richard F. Cheney, Towanda, Pa., and Nicholas W. Rench, Troy, N.Y., assignors to GTE Sylvania Incorporated**

**No Drawing. Original application Oct. 22, 1970, Ser. No. 83,197, now Patent No. 3,684,912. Divided and this application Jan. 14, 1972, Ser. No. 217,987**

**Int. Cl. B22f *7/08***

**U.S. Cl. 75—208 R** **5 Claims**

An emitter type electrode comprising a head consisting essentially of a moldable emissive electrode material, tungsten, and from about 0.2% to about 7% of a Group VIII metal additive that lowers the sintering temperature of tungsten at least about 100° C. and integral with said head and extending therefrom, an electrically conductive tungsten alloy lead consisting essentially of tungsten and from about 1% to about 30% rhenium. In the process for preparing emitter-type electrodes having an integral head and lead by molding, pressing and sintering the improvement comprising adding to the moldable, emissive electrode material and tungsten, that forms the head, prior to pressing and sintering, from about 0.2% to about 7% of a Group VIII metal additive and inserting into the head prior to pressing and sintering a tungsten alloy lead consisting essentially of tungsten and from about 1% by weight to about 30% of rhenium.

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**3,745,001**

## LIQUID LEVEL INDICATOR

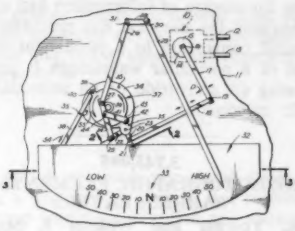
**Victor Nicholas Lawford, Pasadena, and Richard Paul Granada, West Covina, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Nov. 12, 1971, Ser. No. 198,209**

**Int. Cl. G01f *23/16***

**U.S. Cl. 73—299** **5 Claims**

A liquid level indicator for a steam boiler or the like having a differential pressure unit (DPU) connected from the top and the bottom of the boiler. A static pressure sensor is also connected from the top of the boiler. A pointer is rotatably mounted on a base contiguous to a liquid level scale. The pointer is driven by the output of a series of linkages having inputs from both the DPU and the static pressure sensor. The static pressure sensor is employed to produce a correction because the density of boiling water is different at different




temperatures and pressures. Without the correction, the indicator would indicate low at elevated pressure on full tank conditions and would indicate high on empty tank conditions. Both indications are hazardous because turbine damage, tube burn out and explosions are possible. The pointer has a fixed pivot for improved accuracy.

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**3,745,002**

## METHOD OF PREPARING A PRINTING MASTER BY XEROGRAPHY

**Satoru Honjo and Yasuo Tamai, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Sept. 25, 1970, Ser. No. 75,364**

**Claims priority, application Japan, Sept. 30, 1969, 44/78,025**

**Int. Cl. G03g *13/22***

**U.S. Cl. 96—1 R** **4 Claims**

A method of producing an etch resist pattern by xerography consisting of the following steps: forming on a metal substrate a photoconductive insulating coating comprising an intimate mixture of a photoconductive powder and an electrically insulating resin binder containing chemically active functional groups which can react with isocyanate groups; providing an electrostatic latent image on said coating; developing said latent image with a toner comprising a masked polyisocyanate compound; heating the developed plate to an elevated temperature sufficient to regenerate the isocyanate thus causing a reaction between the resin binder in the photoconductive coating and the polyisocyanate whereby the resin binder is completely cured and becomes insoluble in organic solvents, and finally removing the photoconductive coating at the areas where no toner deposition occurred and thus exposing the metal substrate.

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**3,745,003**

## ADJUSTMENT OF COLOR BALANCE IN ELECTROPHORESIS BY MODIFICATION OF PARTICLE SIZE

**Yaqub Moradzadeh, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**No Drawing. Filed June 28, 1971, Ser. No. 157,758**

**Int. Cl. G03g *9/00***

**U.S. Cl. 96—1.2** **3 Claims**

The color balance in a color electrophotographic process is improved by control of the relative sizes of the migrating colored particles.

3,745,004

## PHOTODECOMPOSITION OF DIAZASUCCINIC AND SIMILAR ANHYDRIDES

Arnold Zweig, Westport, and William Arthur Henderson, Jr., Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed July 9, 1971, Ser. No. 161,314
Int. Cl. G03c 1/52
U.S. Cl. 96—49 6 Claims

A system for storage of information and color photography comprising the use of a dye precursor capable of photochemical conversion to a permanent visible image under light of a particular wavelength is provided, said material being an anhydride of an aromatic substituted heterocyclic compound.

3,745,005

## ELECTROPHOTOGRAPHIC ELEMENTS HAVING BARRIER LAYERS

William E. Yoerger and William J. Staudenmayer, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 25, 1971, Ser. No. 174,956
Int. Cl. G03g 5/06
U.S. Cl. 96—1.5 8 Claims

Electrophotographic elements are described which contain a barrier layer interposed between the photoconductive layer and the conductive layer. This barrier layer is formed of a copolymer comprising recurring units derived from vinyl acetate together with recurring units of vinyl pyrrolidone and/or an $\alpha,\beta$-unsaturated monoalkenoic acid.

3,745,006

## PHOTOCONDUCTIVE COMPOSITION EMPLOYING AN INTERPOLYMER BLEND AS BINDER MATERIAL

Robert B. Blance, East Longmeadow, David R. Cahill, Wilbraham, and Peter Wachtel, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Dec. 13, 1968, Ser. No. 783,700, now Patent No. 3,607,376. Divided and this application Apr. 21, 1971, Ser. No. 136,209
Int. Cl. G03g 5/08
U.S. Cl. 96—1.8 8 Claims

Disclosed herein are polymer blends comprising a first interpolymer of a vinyl alcohol ester and at least one ethylenically unsaturated acid ester and a second interpolymer comprising a vinylidene aromatic compound, at least one ethylenically unsaturated acid ester and at least one compound containing one or more acid groups. These blends are particularly useful as binders and adhesives in photoconductive compositions.

3,745,007

## PROCESS FOR IMPROVING COLOR DEVELOPABILITY OF REVERSAL PHOTOGRAPHIC FILMS

Tadashi Nagae, Nobuo Tsuji, and Takushi Miyazako, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed June 1, 1971, Ser. No. 148,903
Claims priority, application Japan, June 1, 1970, 45/47,035
Int. Cl. G03c 5/50, 1/72
U.S. Cl. 96—22 8 Claims

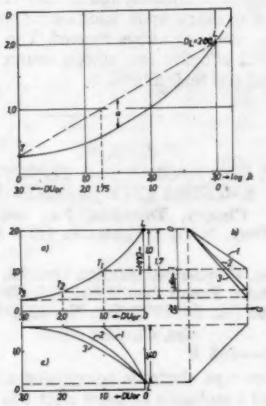
There is provided an improvement in the conventional reversal color process, wherein a photographic element containing three photographic silver halide emulsion layers is subjected to (1) a first exposure to produce a latent image, (2) development in a photographic developer for producing a black-and-white negative image, (3) exposure to light of a color to which said first exposed silver halide emulsion layer is sensitive, and (4) a second development in a color developer for producing a colored image, said color developer containing an aromatic primary amine color developing agent and a photographic color coupler selected from the group consisting of a magenta forming pyrazolone color coupler, a cyan forming phenolic coupler, and a yellow forming open chain ketomethylene color coupler, the improvement comprising providing as a binder for said silver halide, gelatin and a specific water-soluble copolymer exhibiting a molecular weight of from 5,000 to 3,000,000 and further containing a specific repeating unit within its molecular structure.

3,745,008

## PHOTOGRAPHIC PROCESS

Ehrhard Hellmig, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 13, 1971, Ser. No. 133,528
Claims priority, application Germany, Apr. 18, 1970, P 20 18 734.2
Int. Cl. G03c 5/08; G03f 5/18
U.S. Cl. 96—45 4 Claims



Negative continuous tone images are produced from black-and-white or colored originals which originals are differing in their density range whereby the exposure time is determined only from the density of the light areas in the originals and wherein the photographic copying material for making the negative continuous-tone image has a certain characteristic curve which is defined below.

3,745,009

## PHOTOGRAPHIC ELEMENTS AND LIGHT-ABSORBING LAYERS

Philip W. Jenkins, Donald W. Heseltine, and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of application Ser. No. 766,307, Oct. 9, 1968, now Patent No. 3,615,432. This application Oct. 19, 1970, Ser. No. 82,086
Int. Cl. G03c 1/84
U.S. Cl. 96—84 R 21 Claims

Novel photographic materials comprising a light-sensitive layer and a light-absorbing material are described. The light-absorbing materials comprise colored components which are decolorized by various forms of energy, such as, for example heat. The novel light-absorbing materials are useful in antihalation layers particularly adapted for photographic elements designed for development with heat.

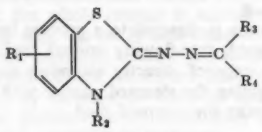
3,745,010

## PHOTOGRAPHIC ELEMENT COMPRISING ULTRAVIOLET-ABSORBING POLYMERS

Wilhelmus Janssens, Aarschot, and Armand Maria Van den Bergh, Berchem, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

No Drawing. Filed May 17, 1971, Ser. No. 144,233
Claims priority, application Great Britain, June 9, 1970, 27,978/70
Int. Cl. G03c 1/84
U.S. Cl. 96—84 R 10 Claims

The invention claims an ultraviolet-absorbing filter layer composition formed from an aqueous solution of a hydrophilic colloid having dispersed therein a hydrophobic copolymer obtained by emulsion polymerization of at least one $\alpha,\beta$-ethylenically unsaturated monomer and of an ultraviolet-absorbing, solid, water-insoluble monomer of the formula:



wherein:

$R_1$=hydrogen, (meth)acryloyloxy or (meth)acryloylamino,
$R_2$=hydrogen, methyl, ethyl or phenyl,
$R_3$=hydrogen, alkyl or phenyl,
$R_4$=hydrogen, (meth)acryloyloxy - substituted phenyl, (meth)acryloylamino-substituted phenyl, (meth)acryloyloxyalkoxy-substituted phenyl.

The ultraviolet-absorbing filter layer composition may be used for the protection of light-sensitive photographic materials against ultraviolet light and for the production of ultraviolet-absorbing filters and filter layers.

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3,745,011

## NOVEL PHOTO RESIST COMPOSITION CONTAINING CYCLIC POLYCARBOXYLIC ACIDS

Donald E. Hudgin, Princeton Junction, N.J., assignor to Narland Products, Inc., New Brunswick, N.J.

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,579
Int. Cl. G03c 1/00
U.S. Cl. 96—88 11 Claims

Organic acid modifiers such as cycloaliphatic and aromatic polycarboxylic acids are incorporated in protein-based photo resists to improve the etch resistance according to the disclosed process. The organic acid modifiers are applied incorporated in the protein-based photo resist composition or as a separate coating during after development of the coated article. Preferred organic acid modifiers are trimellitic and pyromellitic acids in combination with fish glue as the protein material. The novel photo resists disclosed are useful in the process of photo chemical machining.

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3,745,012

## PHOTOSENSITIVE MEDIUM COMPRISING A FURFURYLIDENE, A LOWER HALOALKANE, AND A HOMOPOLYMER OF POLYVINYL CHLORIDE AS BINDER

Edward Zarebski, Holyoke, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

No Drawing. Filed Feb. 4, 1972, Ser. No. 223,776
Int. Cl. G03c 1/52
U.S. Cl. 96—88 R 6 Claims

Negative-working copying materials are prepared by coating a paper or film substrate with an amine-free formulation comprising a homopolymer of polyvinyl chloride, a cyclic acetal of furfural, and a photosensitive lower haloalkane. Images are formed on the copy materials by exposure to ultraviolet light and fixed by heating.

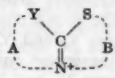
3,745,013

## METHOD FOR MAKING HARDENED GELATIN IMAGES

Reiichi Ohi, Jun Hayashi, and Tadao Shishido, Minami-ashigara, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Kanagawa, Japan

No Drawing. Filed Oct. 18, 1971, Ser. No. 190,258
Claims priority, application Japan, Oct. 19, 1970, 45/91,804
Int. Cl. G03c 1/30
U.S. Cl. 96—111 17 Claims

Hardened gelatin images are formed from silver halide images in the presence of (a) a silver halide solvent, (b) an alkali and (c) a compound represented by the General Formula I:



(I)

wherein A and B are each non-metal atoms necessary for forming a heterocyclic ring, Y is a member selected from the group consisting of sulfur and selenium, and X is an anion.

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3,745,014

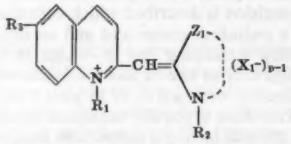
## SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Yoshiyuki Nakazawa, Keisuki Shiba, Akira Sato, and Masanaga Ohki, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Apr. 2, 1971, Ser. No. 130,803
Int. Cl. G03c 1/14
U.S. Cl. 96—124 13 Claims

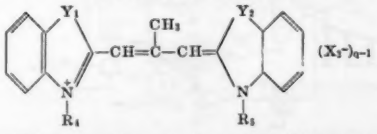
A silver halide photographic emulsion spectrally sensitized with a combination of at least one monomethine cyanine dye represented by General Formula I

GENERAL FORMULA I



wherein $R_1$ and $R_2$ each represent a member selected from the group consisting of an alkyl group, a substituted alkyl group and an allyl group; $R_3$ represents a member selected from the group consisting of a hydrogen atom and a methyl group; $Z_1$ represents an atomic group necessary to complete a member selected from the group consisting of a 2-quinoline nucleus, a benzothiazole nucleus, a benzoselenazole nucleus, and a naphthothiazole nucleus, the hydrogen atom of said nucleus capable of being substituted; $X_1^-$ represents an acid anion; and $p$ is an integer of 1 or 2; said $p$ being 1 when said $R_1$ or $R_2$ is a substituted alkyl group and the dye takes a betaine structure; at least one of the carbocyanine dyes represented by General Formula II

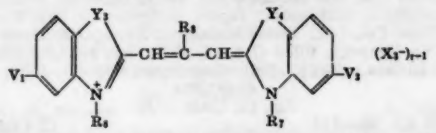
GENERAL FORMULA II



wherein $R_4$ represents a member selected from the group consisting of an ethyl group, an n-propyl group, an n-butyl group, and an allyl group; $R_5$ represents a member selected from the group consisting of a $\gamma$-sulfopropyl group, a $\gamma$-sulfobutyl group, a $\delta$-sulfobutyl group, a $\delta$-carboxybutyl group, and an $\omega$-carboxypentyl group; $Y_1$ and $Y_2$ represent a member selected from the group consisting of a sulfur atom and a selenium atom; $X_2$ represents an acid anion; and $q$ is an integer of 1 or 2, said $q$ is 1 when

the dye takes a betaine structure, and at least one carbocyanine dye represented by General Formula III

GENERAL FORMULA III



wherein $R_6$ and $R_7$ each represent a member selected from the group consisting of a γ-sulfpropyl group, a γ-sulfobutyl group, a δ-sulfobutyl group, a δ-carboxybutyl group, and an ω-carboxypentyl group; $R_8$ represents a member selected from the group consisting of a methyl group and an ethyl group; $Y_3$ and $Y_4$ each respresent a member selected from the group consisting of a sulfur atom and a selenium atom; $V_1$ and $V_2$ each represent a member selected from the group consisting of a hydrogen atom and a halogen atom; $X_3^-$ represents an acid anion; and $r$ is an integer of 1 or 2, said $r$ being 1 when the dye takes a betaine structure.

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**3,745,015**

## SPECTRAL SENSITIZATION OF PHOTODEVELOPABLE SILVER HALIDE EMULSIONS

**Paul Désiré Van Pee, Edegem, Henri Depoorter, Mortsel, Theofiel Hubert Ghys, Kontich, Jules Robert Berendsen, Deurne, and Willy Joseph Vanassche, Aartselaar, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium**

**No Drawing. Filed July 8, 1971, Ser. No. 160,883**
**Claims priority, application Great Britain, Aug. 19, 1970, 39,969/70**
**Int. Cl. G03c *1/08***
**U.S. Cl. 96—125** **10 Claims**

A photodevelopable direct-print radiation sensitive silver halide emulsion is described which comprises an iodine compound, a cadmium compound and an imidacarbocyanine spectrally sensitizing dye in which at least one of the benzorings carries one or more substituents characterized by a Hammet constant $\sigma_p$ of at least 0.25, nitro being excluded. With these spectrally sensitized emulsions direct-print image records having a favourable image-discrimination and a low minimum density can be obtained.

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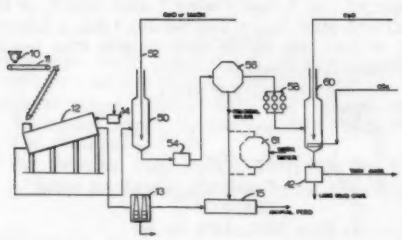
**3,745,016**

## PROCESS FOR PURIFYING SUGAR BEET DIFFUSION JUICE

**Boyd E. Haley, Moses Lake, Wash.**
**(428 W. Spring St., West Haven, Conn. 06516)**

**Filed July 22, 1971, Ser. No. 165,031**
**Int. Cl. A23k *1/00*; A23j *1/16***
**U.S. Cl. 99—2 R** **4 Claims**



A process for recovering a high protein animal feed from a sugar beet diffusion juice containing high protein colloidal and particulate solids is disclosed in which the juice is treated with a pH adjusting material to raise the pH of the juice to a pH of 6.5 to 7.0 without precipitating soluble impurities contained therein. The juice is then heated to a temperature of 75°–95° C. to denature the protein material. The heated diffusion juice is then subjected to centrifugal forces of between 10,000 *g*'s and 100,000 *g*'s to separate the colloidal particulate content from the diffusion juice. The separated solids are partially dried by subjecting the solids to centrifugal forces between 10,000 *g*'s and 100,000 *g*'s to reduce the moisture content of the solids below 50% by weight. The partially dried solids are dried by evaporation to form a dried high protein animal feed having a moisture content of between 5% and 12% by weight.

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**3,745,017**

## ANIMAL FEED PROCESS

**Keith E. Queal, 1243 2d Ave. S., Clinton, Iowa 52732**

**No Drawing. Continuation-in-part of application Ser. No. 592,974, Nov. 9, 1966, now abandoned. This application May 11, 1971, Ser. No. 142,394**
**Int. Cl. A23k *1/02***
**U.S. Cl. 99—6** **9 Claims**

The disclosure is directed to a process for producing a dried, sweetened, free-flowing animal feed. The process includes the steps of directly steaming an animal feed carrier, contacting the steamed carrier with a sweetening agent and drying the steamed feed.

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**3,745,018**

## HUSK-FREE MASH PROCESS

**Edward F. Schuler, Hoffman Estates, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.**

**Filed Aug. 5, 1971, Ser. No. 169,392**
**Int. Cl. C12c *7/00***
**U.S. Cl. 99—52** **11 Claims**

A method of making a malt wort in which the husks of malt are removed prior to mashing to produce a husk-free mash. Malt is finely ground, and the malt husks are separated from the flour. The malt and adjunct are subsequently processed in a manner whereby the adjunct is liquified in the cooker and then added to the husk-free malt in the mash-tun where saccharification takes place. At the completion of saccharification, the insoluble fractions of malt and adjunct are filtered or centrifuged from the mash. As sparging is unnecessary when the husks are not present in the mash, the time required for the brew-house cycle is greatly reduced.

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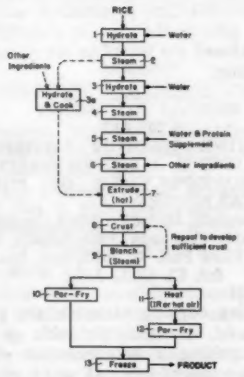
**3,745,019**

## PREPARATION OF PRE-FRIED FOOD PRODUCTS

**Charles C. Huxsoll, El Cerrito, and Douglas N. Homnick, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture**

**Filed Sept. 24, 1971, Ser. No. 183,493**
**Int. Cl. A23l *1/10***
**U.S. Cl. 99—83** **15 Claims**




Novel pre-fried food products are prepared from grains such as rice, wheat, oats, barley, corn, and the like, by

(a) mixing the partially cooked grain with water, protein supplements, spices, seasonings, and other edible foods, (b) steaming the so-mixed ingredients, (c) shaping said mixture into a conveniently dispensible form, e.g., rods, slabs, patties, etc., (d) coating the so-formed material with a crust, and (e) par-frying the so-coated pieces.

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**3,745,020**
**PROCESS FOR PREPARING CITRUS PUREE**

**Bruce J. Lime and Robert R. Cruse, Weslaco, Tex., assignors to the United States of America as represented by the Secretary of Agriculture**

**No Drawing. Filed May 5, 1971, Ser. No. 140,615**
**Int. Cl. A23l *1/06***
**U.S. Cl. 99—100** **4 Claims**

Puree has been prepared from the whole orange fruit. This process can be further modified by a de-oiling step to yield a somewhat different orange puree. In the de-oiling process, the whole orange is submitted to an oil gland rupturing step, the oil is then removed with a fine water spray, the blanched orange is coarsely chopped, partially comminuted and unwanted hard portions and seeds removed by screen-type finisher, and finally the desired orange portions comminuted in a homogenizer to a particle size of 0.005 inch or less.

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**3,745,021**
**METHOD FOR PRODUCING AN EXPANDED MEAT FOOD PRODUCT AND PRODUCT PRODUCED THEREBY**

**Peter Q. Van Middlesworth, Climax, Mich., Marvin E. Buck, Peekskill, N.Y., and Bruce R. Seemann, Fond du Lac, Wis., assignors to General Foods Corporation, White Plains, N.Y.**

**No Drawing. Filed Sept. 17, 1970, Ser. No. 73,177**
**Int. Cl. A22c *18/00*; A22k *1/00***
**U.S. Cl. 99—107** **5 Claims**

An expanded shelf-stable fresh meat food product possessing bacteriostasis is formed by subjecting meat, a farinaceous component, water and water-soluble solutes to elevated temperatures and pressure followed by extrusion to a zone of lower pressure.

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**3,745,022**
**DRY INSTANT COMPOSITION FOR GRAINED CONFECTIONS**

**Charles Burton Broeg, Short Hills, N.J., and Anthony Monti, Irvington, and John P. Troy, Hicksville, N.Y., assignors to SuCrest Corporation, New York, N.Y.**

**No Drawing. Filed Oct. 30, 1970, Ser. No. 85,790**
**Int. Cl. A23g *3/00***
**U.S. Cl. 99—134 G** **8 Claims**

A dry mix for a grained confection product comprises sugar and a fat having a setting point in the range of from above about room temperature to about 110° F., preferably 90 to 100° F., and having a rapid crystallization rate. The mix is blended with sufficient water to fluidize the mix, but not dissolve the ingredients, at a temperature only slightly above the setting point of the fat and, after the moist mixture is formed into the desired configuration, it is cooled to solidify it.

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**3,745,023**
**COMPOSITIONS FOR ENHANCING FLAVOR OF PET FOODS**

**Jack Greenberg, Richmond, Va., and Lawrence S. Spiegel, Andover, Mass., assignors to Robins, A. H., Company, Incorporated, Richmond, Va.**

**No Drawing. Continuation-in-part of application Ser. No. 743,045, July 8, 1968. This application Feb. 5, 1971, Ser. No. 113,061**
**Int. Cl. A23k *1/00*; A23l *1/26***
**U.S. Cl. 99—140 R** **1 Claim**

Food flavoring and appetite enhancing stable clear liquid compositions containing modified animal fat extracts, vegetable oils and other flavoring additives which may be applied to commercially available pet foods in the form of clear liquids, emulsions, and aerosol sprays to enhance the flavor of the pet food.

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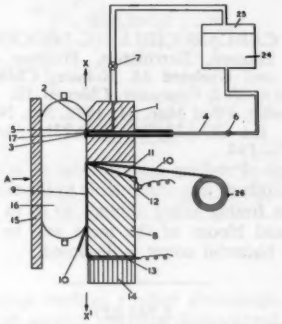
**3,745,024**
**METHOD AND APPARATUS FOR FILLING AND SEALING FLEXIBLE CONTAINERS**

**Andrew George Ford, Hitchin, and Ronald Augustus Hudson, Welwyn Garden City, England, assignors to Imperial Chemical Industries, Limited, London, England**

**Continuation-in-part of application Ser. No. 60,559, Aug. 3, 1970, which is a division of application Ser. No. 797,883, Feb. 10, 1969, now abandoned. This application July 12, 1972, Ser. No. 271,208**
**Claims priority, application Great Britain, Feb. 29, 1968, 9,849/68; June 14, 1968, 28,360/68**
**Int. Cl. B65b *31/06***
**U.S. Cl. 99—171 B** **11 Claims**



A plastics film container is pressurised through an aperture in its wall while held in gas-tight contact with a continuous surface, and the inflated container is slid upon the surface to bring the aperture into contact with a sealing strip, which is sealed around the aperture.

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**3,745,025**
**COMBINED SHIPPING, DISPLAY AND DISPENSING PACKAGE FOR A PLURALITY OF NESTED FRAGILE ARTICLES**

**Paul Hollinger, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.**

**Filed May 13, 1971, Ser. No. 143,106**
**Int. Cl. B65b *23/00***
**U.S. Cl. 99—180** **15 Claims**

An ice cream cone package with a matrix of cells or pockets formed from pluralities of foldable single-faced

corrugated strips embraced on three sides by a single-faced corrugated liner and contained in a flexible envelope, such as polyethylene bag, all nested within a container. The envelope includes an extended portion adapted to be folded over at the top of the matrix after a protective cone pad with starburst cuts and a holder means with die cut openings for the tips of ice cream cones stacked within and projecting from the cells are inserted in the envelope. The holder extends from the matrix to the top rim of the container above the cone tips projecting from the cells, thereby retaining the stacks of cones in place in the cells during shipping and handling of the container. The cells in the matrix have at least three internal walls defined by corrugations disposed to engage the lips of the cones in each stack of cones, thereby immobilizing each cone in each stack. At the point of use, the removal of the protective cone pad and holder means permits dispensing of the cones, individually, from the package.

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**3,745,026**
**CARCASS CHILLING PROCESS**

**Ralph R. Hansen, Barrington, Thomas A. Ray, La Grange, and Gerhard M. Reimer, Chicago, Ill., assignors to Swift & Company, Chicago, Ill.**

**No Drawing. Filed Mar. 31, 1971, Ser. No. 129,974**
**Int. Cl. A22c *18/00*; A23b *1/06***
**U.S. Cl. 99—194** **9 Claims**

A method of chilling carcass meat to substantially reduce the shrinkage loss attributable to the moisture evaporation from freshly killed animals so as to maintain the freshness and bloom of the meat and to substantially reduce the bacterial count is disclosed.

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**3,745,027**
**IMMERSION COOKING IN A STABILIZING SOLUTION COMPRISING POLYHYDRIC ALCOHOL**

**Milton Kaplow, White Plains, and Joseph J. Halik, Yonkers, N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**No Drawing. Continuation of abandoned application Ser. No. 684,551, Nov. 20, 1967. This application Nov. 27, 1970, Ser. No. 93,510**
**Int. Cl. A23b *1/03, 1/12, 7/02, 7/08, 7/10, 1/14***
**U.S. Cl. 99—199** **5 Claims**

Immersion cooking food in a polyhydric alcohol solution preserves the food and imparts moist eating qualities thereto.

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**3,745,028**
**LITHOGRAPHIC PLATE DESENSITIZER FORMULATIONS**

**Frederick J. Rauner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Apr. 26, 1971, Ser. No. 137,611**
**Int. Cl. C09d *5/20*; C09k *3/00, 3/18***
**U.S. Cl. 106—2** **9 Claims**

Lithographic plate desensitizer formulations based on hydrophilic colloids are improved by the addition of high molecular weight, water-soluble polyethylene glycols and dialdehydes.

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**3,745,029**
**ECOLOGICALLY SAFE ANTI-CORROSION METAL POLISHES**

**James G. Murphy, 5111 Edgemoor Lane, Bethesda, Md. 20014**

**No Drawing. Filed Nov. 22, 1971, Ser. No. 201,105**
**Int. Cl. C09g *1/02***
**U.S. Cl. 106—3** **10 Claims**

The glyceryl mono-esters of higher fatty acids, preferably the 16–22 carbon straight chain saturated fatty acids and an abrasive constitute ecologically safe, tarnish resistant polishing and cleaning materials for bare metal objects.

**3,745,030**
**INSULATING AND CORROSION PROTECTIVE MATERIAL**

**Roy E. Nelson, Salt Lake City, Utah, and Charles William Matthews, Hinsdale, Ill., assignors to American Gilsonite Company, Salt Lake City, Utah**

**No Drawing. Continuation of application Ser. No. 800,730, Feb. 19, 1969. This application May 27, 1971, Ser. No. 147,645**
**Int. Cl. C09d *5/08***
**U.S. Cl. 106—14** **7 Claims**

Insulation of pipes and similar structures to prevent corrosion and retard the flow of heat is accomplished by surrounding the structure with particulate coal.

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**3,745,031**
**INSULATING COMPOSITION**

**Benjamin B. Kaplan, West Hartford, Conn., assignor to Albi Manufacturing Corporation, Rockville, Conn.**

**No Drawing. Filed Sept. 17, 1971, Ser. No. 181,571**
**Int. Cl. C09d *5/18***
**U.S. Cl. 106—15 FP** **4 Claims**

An insulating coating comprising a magnesium oxychloride cement covered by an intumescent paint is applied to structural steel to provide heat and fire insulation for exposure periods greater than two hours.

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**3,745,032**
**LOW EXPANSION, MULTIBAND TRANSMITTING GLASS**

**Roger A. Miller, Montclair, and Steven C. Colburn, La Palma, Calif., assignors to General Dynamics Corporation**

**Filed Sept. 20, 1971, Ser. No. 181,929**
**Int. Cl. C03c *3/12, 3/30, 3/00***
**U.S. Cl. 106—47 R** **8 Claims**

Glass compositions are disclosed which have low thermal expansion characteristics and excellent infrared and ultraviolet or radio frequency transmittance characteristics. These compositions are useful in manufacturing domes suitable for housing infrared and ultraviolet or radio frequency detectors such as are used in missile systems. The glasses are basically germanium oxide glasses including suitable amounts of alkali oxides, zinc oxide, calcium oxide, zirconium oxide, aluminum oxide and others. The addition of certain rare-earth oxides, such as ytterbium oxide, give a desirable increase in surface hardness.

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**3,745,033**
**USEFUL WAX COMPOSITIONS**

**Robert B. Hutchison, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio**

**No Drawing. Filed Aug. 23, 1971, Ser. No. 174,252**
**Int. Cl. C08h *9/06***
**U.S. Cl. 106—270** **8 Claims**

This invention relates to compositions useful as substitutes for natural waxes. The compositions are obtained by blending high molecular weight α-branched monocarboxylic acids with microcrystalline petroleum wax and mixed glycerides of saturated mono- and dicarboxylic acids. The wax compositions exhibit emulsifier and stability characteristics similar to beeswax and may be employed in cosmetic formulations.

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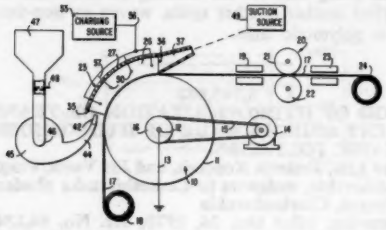
**3,745,034**
**ELECTROSTATIC COATING OF METAL POWDER ON METAL STRIP**

**Edwin J. Smith, Winterville, and Robert B. Reif, Grove City, Ohio, assignors to National Steel Corporation**

**Continuation of application Ser. No. 660,787, Aug. 15, 1967. This application Aug. 14, 1970, Ser. No. 63,896**
**Int. Cl. B05b *5/02*; B44d *1/094***
**U.S. Cl. 117—17** **8 Claims**

Method and apparatus for applying a metallic coating on metal strip, particularly steel strip, by electrostatically depositing on the strip a uniform layer of metal powder

and thereafter subjecting the strip and the layer of metal powder to heat treatment and then compaction to effect




cohesion of the particles of metal powder and adhesion of the metal powder particles to the strip.

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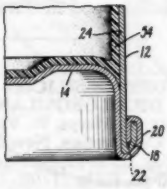
**3,745,035**
**CONTAINER LINING METHOD**
**Thomas D. Troughton, Richmond, and Leonard B. McKee, Alameda, Calif., assignors to Rheem Manufacturing Company, New York, N.Y.**
**Filed Dec. 3, 1970, Ser. No. 94,685**
**Int. Cl. B44d** *1/094*
**U.S. Cl. 117—18** **10 Claims**



A method for protectively lining containers by heating liner-forming material disposed on the container interior surfaces wherein a single end-closure member is secured in air-permeable relation to the container casing and so maintained during heating of the liner-forming material.

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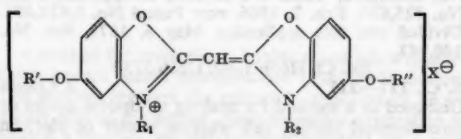
**3,745,036**
**OPTICAL BRIGHTENING COMPOSITION AND METHOD OF BRIGHTENING FIBRES MADE OF CELLULOSE AND POLYAMIDE**
**Reinhard Zweidler, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**
**No Drawing. Continuation of application Ser. No. 774,594, Nov. 5, 1968, which is a continuation of application Ser. No. 463,955, June 14, 1965, both now abandoned. This application May 7, 1971, Ser. No. 141,419**
**Int. Cl. C09k** *1/00*
**U.S. Cl. 117—33.5 T** **4 Claims**

The process of optically brightening cellulose, cellulose acetate, and polyamide fibres in an aqueous solution by treating the fibres with an aqueous solution of optical brightener of the formula:




wherein R′ and R″ are low alkyl; $R_1$ and $R_2$ are low alkyl; and X is a colourless anion; and a fatty alcohol polyglycol ether.

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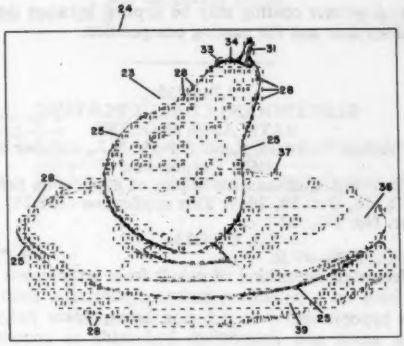
**3,745,037**
**METHOD FOR PRODUCING DIAGRAMMED WORK SURFACES ON WHICH ARE CREATED ARTISTIC RENDERINGS OF MULTI-COLOR IMAGES**
**John Kent Bowker, Marblehead, Mass., assignor to Itek Corporation, Lexington, Mass.**
**Filed Mar. 26, 1971, Ser. No. 128,418**
**Int. Cl. H04g** *1/00, 1/46*
**U.S. Cl. 117—37 R** **26 Claims**



A given image such as a color photograph is used to produce a work surface retaining diagrammed boundaries that define general areas on which distinctly colored paints can be applied to create a rendering of the picture images on the photograph. Selected and identified, in a given colorimetric system, are boundaries of color domains corresponding generally to color tonalities of the photograph. A distinctly colored oil paint is then provided to represent each of the color domains and each paint color is given an identifying designation. Scanning through discrete portions of the photograph with a suitable color analyzer system establishes in the given colorimetric system the coordinate positions of the colors present in each of the portions scanned. Next, a determination is made as to the particular one of the selected color domains encompassing the color coordinate position of each of the analyzed colors in the photograph. Finally, discrete areas of the paint receiving work surface that correspond geometrically in position to the discrete portions scanned in the photograph are located and there is applied to each work surface area the designation for that paint color representing the color domain that encompasses the color coordinate position of the analyzed color in the geometrically corresponding portion of the photograph. Application to the work surface areas of the distinct colored paint designated thereon results in an artistic rendering of the image scene retained by the original photograph.

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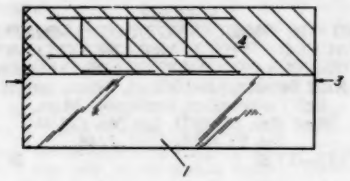
**3,745,038**
**POLYOLEFIN FILM MATERIAL**
**Keith Derek Jeffs, Waterlooville, England, assignor to The Metal Box Company Limited, London, England**
**Filed Apr. 15, 1971, Ser. No. 134,263**
**Int. Cl. B32b** *27/30;* **B44d** *1/092*
**U.S. Cl. 117—47 A** **3 Claims**

Polyolefin film material is, at least in part, rendered receptive to writing media by first oxidising a surface of the material and then coating the oxidised surface with a coating composition which comprises a polymer disper-

sion of a copolymer of vinyl acetate with an alkyl acrylate added to a titanium dioxide pigment and a particulate



filler. A primer coating may be applied between the oxidised surface and the coating composition.

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**3,745,039**
**ELECTROLESS COBALT PLATING BATH AND PROCESS**
**Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation**
**No Drawing. Continuation-in-part of application Ser. No. 872,750, Oct. 30, 1969. This application Oct. 28, 1971, Ser. No. 193,582**
**Int. Cl. C23c *3/02***
**U.S. Cl. 117—47 R** **5 Claims**

Electroless deposition of cobalt from an aqueous alkaline bath on a palladium activated substrate. Bath contains hypophosphite as reducing agent, linear polyphosphate anion and ammonium hydroxide as complexing agents and small controlled amounts of nickel ion. Cobalt will also deposit without nickel ions being in bath by providing nickel strike on substrate.

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**3,745,040**
**RESINOUS SURFACE COVERING AND PROCESS FOR PRODUCING SAME**
**John Fraser Morton and James C. Schlaffer, Westminster, Md., Robert J. Eitzel, Wilmington, Del., and Joseph A. Fowler, Swarthmore, Pa., assignors to Congoleum Industries, Inc., Kearny, N.J.**
**No Drawing. Filed Jan. 26, 1971, Ser. No. 109,937**
**Int. Cl. B32b *5/20*; D06n *3/04***
**U.S. Cl. 117—76 FB** **26 Claims**

A process for producing a resinous surface covering including impregnating a felted cellulosic backing layer with 40% to about 85% by weight of the dry felt with a resinous strengthening impregnant, coating the backing layer with a foamable resin including a stabilizer such as organotin compounds and mixtures thereof, coating the foamable resin with a non-foamable resin having an organotin stabilizer therein, and heating the layered article to foam the foamable resin and fuse the non-foamable resin to thereby produce a surface covering having a high resistance to delamination and discoloration at high temperatures, and the product so produced.

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**3,745,041**
**COMPOSITION AND METHOD FOR SURFACING LEATHERS AND LEATHER SUBSTITUTES BASED ON FILLED POLYURETHANE LATEX**
**Albert E. Raymond, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**No Drawing. Original application Aug. 26, 1968, Ser. No. 755,436. Divided and this application Feb. 11, 1971, Ser. No. 114,697**
**Int. Cl. C08h *19/02***
**U.S. Cl. 117—76 R** **9 Claims**

Formation of leather-like surfacing from coating compositions comprising aqueous dispersions of polyurethane latex containing 10 to 50 percent by weight of a tough, flexible, organic particulate filler such as leather dust, organic spheroids, or the like, having an average diameter of 10 to 75 microns, the slurry having a mayonnaise-like consistency and a viscosity of about 30 to 2500 poise and being suitable for coating of substrates such as imperfect leather, leather splits, woven or non-woven fabrics, or polymeric films.

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**3,745,042**
**METHOD OF HYDROPHILIZATION OF TRANSPARENT OBJECTS MADE OF HYDROPHOBIC ORGANIC POLYMERS**
**Drahoslav Lim, Jindrich Kopecek, and Jiri Vacik, Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia**
**No Drawing. Filed Oct. 26, 1970, Ser. No. 84,134**
**Claims priority, appplication Czechoslovakia, Dec. 15, 1969, 8,250/69**
**Int. Cl. B44d *1/50, 1/02*; G02c *7/04***
**U.S. Cl. 117—138.8 A** **7 Claims**

Method of hydrophilizing and imparting anti-fog properties to hydrophobic, transparent, polymeric objects adapted for use as optical aids comprising swelling the surface of a hydrophobic, transparent, polymeric object by contacting said object with at least one hydrophilic monoethylenically unsaturated monomer and thereafter polymerizing said monomer in the presence of a polymerization initiator to thereby form a hydrophilic, polymeric layer integrally bonded to said hydrophobic polymer surface. These monomers are selected from the group consisting of ethylene glycol methacrylate, butyl methacrylate, benzyl methacrylate, dialkyl carbonate, acrylamide, methacrylamide, and mixtures thereof.

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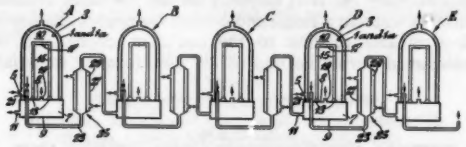
**3,745,043**
**MANUFACTURE OF SILICON METAL FROM DICHLOROSILANE**
**Howard B. Bradley, St. Marys, W. Va., assignor to Union Carbide Corporation, New York, N.Y.**
**Filed May 13, 1971, Ser. No. 143,137**
**Int. Cl. C01c *11/00, 13/00***
**U.S. Cl. 117—201** **8 Claims**



A process for the manufacture of silicon metal by the decomposition of dichlorosilane in admixture with hydrogen in a reaction zone containing a decomposition surface wherein the residence time of the gases within the reaction zone is not greater than about 3/10 of a second. This process achieves minimum formation of by-production chlorosilanes.

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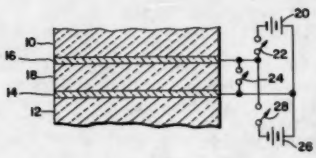
**3,745,044**
**OPTICAL DEVICE**
**Eugene C. Letter, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.**
**Application Sept. 29, 1969, Ser. No. 861,969, now Patent No. 3,620,866, which is a division of application Ser. No. 525,620, Feb. 7, 1966, now Patent No. 3,630,603. Divided and this application May 6, 1971, Ser. No. 140,942**
**Int. Cl. H05b *3/00*; C23b *5/50***
**U.S. Cl. 117—211** **3 Claims**

Disclosed in a method for making an optical device or electro-chemical storage cell wherein a pair of electron

conductor electrodes are separated by a solid state electrolytic layer containing ions available for reversible oxidation and reduction reactions in response to an electrical potential applied across the electrodes.

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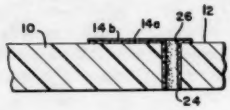
3,745,045

## ELECTRICAL CONTACT SURFACE USING AN INK CONTAINING A PLATING CATALYST

Richard Lee Brenneman, 25 Falcon Court, Mechanicsburg, Pa. 17055, and Richard Henry Zimmerman, 50 Sycamore Lane, Palmyra, Pa. 17078

Filed Jan. 6, 1971, Ser. No. 104,391
Int. Cl. B41m 3/08
U.S. Cl. 117—212 4 Claims




A conductive surface of the type engaged by a contact spring is formed by depositing an ink carrying a plating catalyst on an insulating substrate and plating the inked surface with an electroless plating material. The ink incorporates a catalyzing agent in the form of particles or flakes of nickel or aluminum to produce an even and adequate reduction of electroless plating onto the surface thereof. Precisely defined contact surfaces which may be extended through small holes in a supporting and insulating substrate are made using the foregoing materials. The ink may additionally be made conductive, if desired.

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3,745,046

## METHOD FOR PRODUCING BUBBLE DOMAINS IN MAGNETIC FILM-SUBSTRATE STRUCTURES

Jack E. Mee, Paul J. Besser, George R. Pulliam, David M. Heinz, and Perry E. Elkins, Orange, Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Dec. 28, 1970, Ser. No. 101,785
Int. Cl. H01f 10/06
U.S. Cl. 117—235 7 Claims

A method for producing a bubble domain in a magnetic single crystal garnet film-substrate structure is disclosed. The method involves the epitaxial deposition of an iron garnet film of the proper crystallographic orientation and having a positive magnetostriction constant on a garnet substrate in which the room temperature lattice constant of the film is larger than the room temperature lattice constant of the substrate, preferably by an amount less than 0.035 angstrom.

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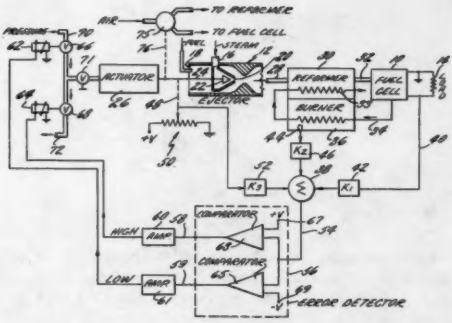
3,745,047

## PROPORTIONAL ACTION ELECTRONIC FUEL CONTROL FOR FUEL CELLS

Salvatore Fanciullo, Plainville, Richard N. Gagnon, Glastonbury, and Warren S. Summers, Tolland, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 31, 1970, Ser. No. 103,246
Int. Cl. H01m 27/00
U.S. Cl. 136—86 B 10 Claims




A proportional electronic fuel control controls the feed flow of fuel to the reformer of a fuel cell system in response to fuel cell current, reformer temperature and the position of the fuel flow control valve. The electronic control produces a proportional control signal which actuates solenoids in a digital manner to regulate the position of the fuel flow control valve. A deadband is provided in the electronic control to prevent continuous cycling of the control valve.

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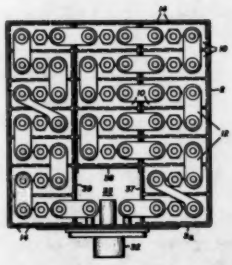
3,745,048

## BATTERY COOLING SYSTEM

Leonard R. Dinkler and John M. Evjen, Gainesville, Fla., assignors to General Electric Company, Owensboro, Ky.

Filed Dec. 30, 1970, Ser. No. 102,701
Int. Cl. H01m 45/02
U.S. Cl. 136—166 1 Claim



A battery cooling system is described comprising a casing and a group of cells having rib members thereon. Upper and lower plenums formed within the casing are

interconnected by passageways between adjoining cells created by the ribs and cell walls to provide a uniform flow of coolant around each cell in the casing.

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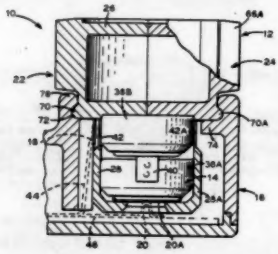
**3,745,049**
**ELECTRICALLY COMMUTATING BATTERY CASES**
**Gordon E. Kaye, Irvington, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.**
**Filed Apr. 23, 1971, Ser. No. 136,944**
**Int. Cl. H01m** *1/02*
**U.S. Cl. 136—173** **14 Claims**



A combination battery cell holder and switch in which a stack of one or more cells is disposed co-axially in a rotary cylindrical case having two windows through which the cell surfaces of opposite polarities may be engaged or disengaged by two contacts external of the case and supported in a housing that also encloses and supports the case for angular motion to close or to open the circuit between the contacts and the cell surfaces.

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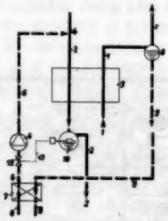
**3,745,050**
**PROCESS AND APPARATUS FOR ABSTRACTING HEAT FROM A FLOW OF GAS**
**Mehmet Sahabettin Ergenc, Zolligerberg, Zurich, and Fortunat Hartmann, Zurich, Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland**
**Filed June 8, 1970, Ser. No. 44,179**
**Claims priority, application Switzerland, June 23, 1969, 9,567/69**
**Int. Cl. F24f** *3/14*
**U.S. Cl. 165—1** **5 Claims**



The dry flow of cool gas which is to be heated in the heat exchanger by the flow of warm moist gas is injected with liquid prior to or during the heat exchange period in order to extract more heat for vaporization of the liquid from the warm gas flow. The liquid injection can be carried out in one or more steps so that the heat exchange follows the graphic representations of FIG. 2 or 4.

**ERRATA**

For Classes 148—1.5 thru 156—527 see:
Patents Nos. 3,745,070 thru 3,745,086

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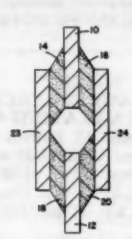
**3,745,051**
**QUADRUPLE LAP SIMPLE SHEAR TEST SPECIMEN**
**Judson R. Griffin, Huntsville, Donald L. Martin, Jr., Albertville, and Robert E. Siron, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army**
**Filed Nov. 9, 1971, Ser. No. 197,000**
**Int. Cl. B32b** *3/02*
**U.S. Cl. 161—44** **3 Claims**



A simple shear test specimen having two aligned load plates. A piece of material to be tested bonded to each of the outer surfaces of each load plate and two side plates one bonded to the outer surface of one of the pieces of material to be tested on each load plate and the other bonded to the outer surfaces of the other two pieces of material to be tested.

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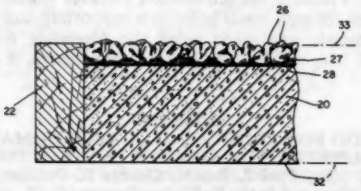
**3,745,052**
**BUILDING PANEL WITH HIGH RELIEF AGGREGATE FACE**
**Lawrence D. Higgins, R.D. 1, P.O. Box 17, Kintnersville, Pa. 18930**
**Filed Nov. 24, 1971, Ser. No. 201,804**
**Int. Cl. B32b** *1/04, 5/16*
**U.S. Cl. 161—44** **10 Claims**



A building panel, having a frame designed to hold a backing of polyurethane foam or like material, with a resin laminate layer laid on the foam, and a gel layer laid on the laminate layer, with aggregate embedded in the gel to a depth of about one-third to one-fourth, to achieve a high relief aggregate face.

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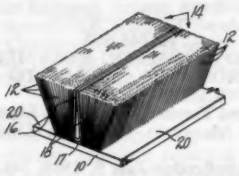
**3,745,053**
**WEATHERSTRIP**
**Leonard W. Johnson, Amesbury, and Albert E. Newton, Beverly, Mass., assignors to USM Corporation, Flemington, N.J.**
**Filed May 26, 1972, Ser. No. 257,431**
**Int. Cl. D04h** *11/00;* **E06b** *7/22*
**U.S. Cl. 161—63** **6 Claims**

A weatherstrip for sealing joints between spaced members, as between a door or and its jamb, has a base of indefinite length from which project filament members form-

ing pile along the length of the base. A flexible barrier member within the pile extends along the length of the pile to aid in sealing the joint. The barrier is secured only to the pile.

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3,745,054

## HIGH FILLER CONTENT HOT MELT BACKSIZE ADHESIVE COMPOSITIONS

George E. Smedberg, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 29, 1971, Ser. No. 194,025
Int. Cl. D05c *17/02*; C08f *45/52*
U.S. Cl. 161—67 11 Claims

Compositions suitable for backsizing tufted carpets comprising a blend of an ethylene/vinyl ester copolymer, microcrystalline wax, an aliphatic thermoplastic hydrocarbon resin substantially free of polymerized aromatics, a polymer resin derived from the alkylation of aromatic compounds with dicyclopentadiene, an antioxidant, and about 50–75 weight percent filler. Carpets of improved hand and strike through wherein the above composition is applied as the secondary scrim and/or tuft bonding backsize adhesive.

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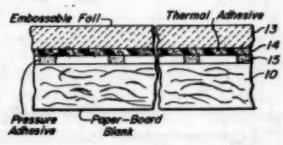
3,745,055

## ASSEMBLY FOR MAKING A PAPER BOARD SOUND RECORDING PACKAGE

Harry Gorman, 200 W. 54th St., New York, N.Y. 10019

Continuation of abandoned application Ser. No. 789,473, Jan. 7, 1969. This application Mar. 1, 1971, Ser. No. 119,900
Int. Cl. B32b *3/04*
U.S. Cl. 161—102 1 Claim




A method of making packages with sound-recording portions thereon is described. The composite of package materials adapted for impression with the recorded sound-producing image means is described as well as the novel process whereby previous steps are modified and others eliminated.

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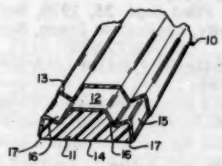
3,745,056

## TRIM STRIP STRUCTURE

Norman C. Jackson, Sheffield Lake, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Continuation-in-part of abandoned applications Ser. No. 706,098, Feb. 16, 1968, and Ser. No. 813,053, Apr. 3, 1969. This application Apr. 5, 1971, Ser. No. 131,410
Int. Cl. B32b *3/00, 3/02*
U.S. Cl. 161—118 15 Claims

A trim strip structure comprised of a body of synthetic polymeric resinous material and a strip of thin metal, which resinous material and metal are of such a composition and so dimensioned and inter-related that the assembly is longitudinally and laterally stable and will readily take a set in any desired contour without any adverse effect on the appearance of the strip.

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3,745,057

## STERILIZABLE PACKAGES AND DESICCANT AND FUMIGANT PACKAGES OF OPEN CELL MICROPOROUS FILM

John T. Loft, Springfield, N.J., John A. McTaggart, Erie, Pa., and Steven G. Plovan, Livingston, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Apr. 15, 1971, Ser. No. 134,429
Int. Cl. B32b *3/26, 5/18*
U.S. Cl. 161—159 19 Claims

Desiccant or fumigant packaging provides a highly desirable end use for certain open-celled microporous films because of the pore size and distribution which, in the desiccant packaging application, allows rapid transport of moisture vapor into the package and in fumigant packaging situations, permits a slow release (evaporation) of a solid or liquid fumigant.

These flexible, high strength films not only prevent gross contamination of surroundings but also possess good resistance to heat, water, and many solvents.

Sterile packaging is a highly desirable end use for certain open-cell microporous films because of their high level of gaseous sterilant transmission; moisture insensitivity and bacteria impermeability.

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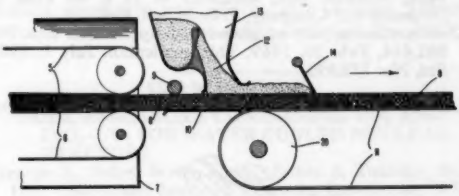
3,745,058

## BUILDING MATERIAL AND METHOD OF MAKING IT

André Paymal, Clermont, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Original application Oct. 31, 1967, Ser. No. 679,412, now Patent No. 3,608,028, dated Sept. 21, 1971. Divided and this application Sept. 8, 1970, Ser. No. 69,904
Int. Cl. B32b *5/46*
U.S. Cl. 161—162 14 Claims



Strong structural materials of good insulating and fireproofing value are made from compressed polystyrene pearls and interstitial, hardened cementitious material.

3,745,059

## HEAT-SENSITIVE STENCIL SHEET

Keishi Kubo, Kanagawa-ken, and Kiyoshi Sakai and Kenjhi Ito, Tokyo, Japan, assignors to Ricoh Co., Ltd., Ohta-ku, Tokyo, Japan

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,781
Claims priority, application Japan, Sept. 29, 1969, 44/77,994
Int. Cl. B41c *1/14*; B41m *1/12*; B44d *3/30*
U.S. Cl. 161—165 8 Claims

A heat-sensitive stencil sheet comprising a thin porous supporting sheet having bonded thereon a heat-shrinkable thermoplastic film coated with a layer containing a release agent which is a silicon resin or an anionic surface active agent.

3,745,060

## HEAT INSULATING FIBROUS MASS

Claude Jumentier, La Celle Saint Cloud, and Alain Bonnet, Clermont, France, assignors to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Original application May 6, 1968, Ser. No. 726,706, now Patent No. 3,616,030. Divided and this application Dec. 23, 1970, Ser. No. 101,060
Claims priority, application France, May 11 1967, 106,046; May 12, 1967, 106,273; Apr. 18, 1968, 148,483
Int. Cl. B32b *5/16*
U.S. Cl. 161—170 11 Claims

The invention contemplates the homogeneous distribution of hard granules or particles throughout a mass of resin-coated mineral fibers to produce structural units in the form of sheets or slabs composed of the mass of mineral fibers in lattice-work form, particularly glass fibers, agglomerated with the dried and cured resin binder and having interspersed in the meshes of the mass, the separate hard and indeformable particles, either in solid form, such as sand, or in porous form, such as perlite or vermiculite, which render the structural units strongly resistant to physical deformation while enhancing the heat-insulating characteristics thereof.

3,745,061

## SYNTHETIC FILAMENTS HAVING AT LEAST THREE CONTINUOUS NONROUND VOIDS

Ashok Jivanlal Champaneria and Melven Raymond Lindbeck, Seaford, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 802,414, Feb. 26, 1969. This application July 1, 1971, Ser. No. 158,993
Int. Cl. D02g *3/22*
U.S. Cl. 161—178 5 Claims

A yarn of continuous filaments spun from a thermoplastic polymer through segmented orifices. Each of a large percentage of the filaments has at least three continuous voids, a void content of about 10–35% and an exterior surface free from any appreciable concavity. The yarn gives a good dye yield and improved soiling performance.

3,745,062

## CROSSLINKED AROMATIC POLYMERS HAVING DIRECT AROMATIC NUCLEI TO AROMATIC NUCLEI LINKAGES

Alan J. Neale and Terence J. Rawlings, Llangollen, Wales, assignors to Monsanto Chemicals Limited, London, England

No Drawing. Application July 9, 1968, Ser. No. 743,328, which is a continuation-in-part of application Ser. No. 433,474, Feb. 17, 1965. Divided and this application Dec. 21, 1970, Ser. No. 100,406
Claims priority, application Great Britain, Feb. 20, 1964, 7,100/64; July 10, 1967, 31,589/67
Int. Cl. B32b *13/04*, *19/08*
U.S. Cl. 161—205 8 Claims

Disclosed herein are crosslinked insoluble, infusible, thermally stable polyphenylene resins comprising a plurality of recurring polyvalent aromatic radicals, which are characterized by direct aromatic nuclei to aromatic nuclei linkages, which resins are prepared by the thermal condensation reaction of an aromatic sulfonyl halide and an aromatic compound containing replaceable nuclear hydrogen atoms.

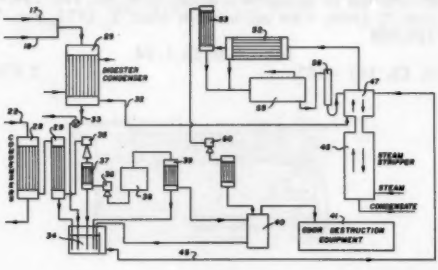
The aromatic radicals are single ring or fused ring carbocyclic or heterocyclic moieties and include those compounds wherein the aromatic radicals are joined by a divalent linking radical.

3,745,063

## PROCESS FOR SIMULTANEOUS TURPENTINE RECOVERY AND ODOR CONTROL

John H. Fisher, Vancouver, British Columbia, Canada, assignor to British Columbia Forest Products Limited, Vancouver, British Columbia, Canada

Filed Nov. 1, 1971, Ser. No. 194,471
Int. Cl. D21c *11/06*, *11/08*
U.S. Cl. 162—15 13 Claims




Vaporous relief gases from the flashers and the chip preheaters used in the standard kraft pulping process are directed to a digester condenser; vaporous relief gases from the evaporators of said process are directed to condensing apparatus; the former gases are partially condensed in the digester condenser and the condensate therefrom is combined with part or all of the condensate from the evaporator condensing apparatus and both of these are directed to a steam stripper. The uncondensed gases from the digester condenser are conducted to the condensing system of the stripper where these gases are condensed together with vaporous gases arising from the stripper. Following this simultaneous condensation of the two sources of gas, the turpentine is recovered and the odorous foul gases are directed to equipment for their destruction together with uncondensed gases from the evaporator condensing apparatus.

3,745,064

## METHOD FOR REDUCING THE SULFUR TRIOXIDE CONTENT OF COMBUSTION GASES RESULTING FROM THE COMBUSTION OF SPENT PULPING LIQUORS

Axel Mentor Isaksson, Arjang, Sweden, assignor to Bycosin AB, Karlstad, Sweden

No Drawing. Continuation-in-part of abandoned application Ser. No. 717,980, Apr. 1, 1968. This application Dec. 28, 1970, Ser. No. 102,066

Int. Cl. D21c *11/12*

U.S. Cl. 162—30 9 Claims

Improved combustion of spent liquors from the sulfite and sulfate cellulose processes resulting in a significant decrease of $SO_3$ content in the flue gases from the combustion is obtained by mixing the spent liquors with a compound of a Group II*a* element with the exception of beryllium and radium such as a mixture of a metal salt and a metal soap, particularly magnesium sulfate and magnesium tall oil fatty acid soap. The spent liquors containing Group II*a* compounds, the alkaline earth metal compounds, can then be combusted.

3,745,065

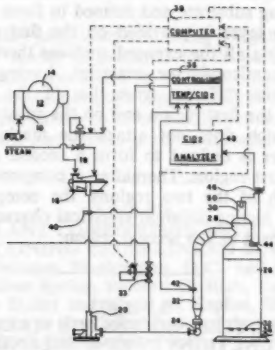
## CONTROL OF CHLORINE DIOXIDE BLEACHING

Jaakko E. Niilo-Rama and Donald L. Whitley, Wisconsin Rapids, Wis., assignors to Consolidated Papers Inc., Wisconsin Rapids, Wis.

Filed Sept. 7, 1971, Ser. No. 178,278

Int. Cl. D21c *7/12*

U.S. Cl. 162—49 3 Claims




Bleaching of cellulosic materials with chlorine dioxide in a conventional bleaching tower while maintaining the temperature and mass flow rate of incoming pulp substantially constant is controlled by continuously measuring the concentration of residual gaseous chlorine dioxide in the head space of the tower and adjusting the input of chlorine dioxide to achieve a residual level correlated to the desired degree of brightness.

3,745,066

## RESILIENT FORAMINOUS PAPER WEB FORMING BELT WITH FORAMINA THAT CLOSE UNDER PRESSURE

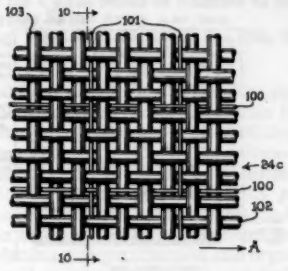
Keith T. Bleuer, 1663 Wilshire Drive NE., Rochester, Minn. 55901

Filed Jan. 13, 1970, Ser. No. 2,552

Int. Cl. D03d *7/00, 15/08;* D21f *1/10*

U.S. Cl. 162—301 15 Claims

A paper web forming belt which is composed of a loop of material that is at least partially resilient and which has water drainage openings through it that are closed due to the resilience of the material when the belt is put under pressure. In one form, the belt has a multitude of tabs struck from it which are raised from the plane of the belt so that the tabs are moved back into the plane when the belt is under pressure, and in another form the belt consists of interwoven warp and shute filaments some of which are of elastomeric material so that the interstices between the filaments are closed due to the spreading of the elastomeric filaments when the belt is put under pressure.




3,745,067

## PRODUCTION OF HIGH PURITY IODINE-131 RADIOISOTOPE

Hirofumi Arino, Suffern, N.Y., Wayne J. Gemmill, Sr., Milford, Pa., and Henry H. Kramer, Mahwah, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,891

Int. Cl. C01b *7/14;* G21g *1/02*

U.S. Cl. 176—16 8 Claims

High purity radioactive iodine-131 is obtained in a stable chemical form by the dry distillation of a neutron-irradiated tellurium containing material, such as tellurium dioxide, onto alumina followed by elution with a base such as a dilute alkaline solution. Radioactive iodine-131 can be prepared by this process with a minimum of radioactive contamination to the immediate environment. The radioactive iodine-131 obtained by this process is a versatile tracer and is useful to determine blood volume, cardiac output and the like.

3,745,068

## PROCESS OF PREVENTING NITRIDATION OF STEEL SUBMERGED IN LIQUID SODIUM

Albert K. Fischer, Western Springs, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Sept. 21, 1971, Ser. No. 182,518

Int. Cl. B01j *1/16;* G21c *9/00*

U.S. Cl. 176—38 8 Claims

A process of preventing nitridation of steel submerged in liquid sodium, especially the stainless steel components of nuclear reactors which are submerged in liquid sodium coolant, which comprises adding an effective amount of calcium or magnesium to the liquid sodium for reacting with nitrogen carriers present in the sodium or with the sodium impurities which form such carriers whereby nitrogen is prevented from being carried to the stainless steel.

3,745,069

## FUEL ASSEMBLIES CONTAINING $UO_2$ AND $PuO_2$–$UO_2$ FOR WATER COOLED NUCLEAR REACTORS

George A. Sofer, White Plains, James S. Tulenko, Bedford Village, and James R. Tomonto, Hawthorne, N.Y., assignors to United Nuclear Corporation, Elmsford, N.Y.

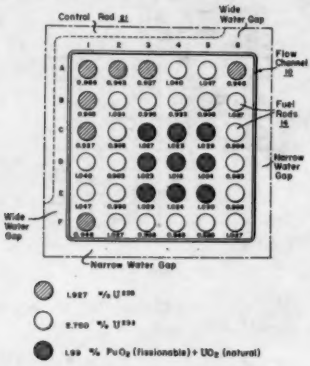
Filed Oct. 30, 1969, Ser. No. 872,586

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 7 Claims

A water cooled nuclear reactor typically includes a core comprising a plurality of rod-type nuclear fuel assemblies

separated by water gaps. A fuel assembly for utilizing plutonium-bearing fuel rods comprises a plurality of fuel rods containing uranium oxide for occupying the regions near the large water gaps between adjacent assemblies and




one or more fuel rods containing a mixture of plutonium oxide and uranium oxide disposed in the interior of the assembly. Preferably the plutonium oxide is deployed in the minimum number of rods consistent with the power peaking requirements of the reactor.

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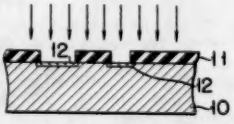
**3,745,070**
**METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES**
**Kazuo Yada, Tokyo, Yamichi Ohmura, Sagamihara-shi, Hideharu Egawa, Tokyo, and Saburo Fukasaku, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**
**Filed Sept. 30, 1969, Ser. No. 862,438**
**Claims priority, application Japan, Oct. 4, 1968, 43/71,852**
**Int. Cl. H01l 7/54**
**U.S. Cl. 148—1.5** **13 Claims**




Semiconductor devices are manufactured by forming at least one implanted layer on the surface of a semiconductor substrate by implanting an active impurity thereinto and annealing the substrate in an oxidizing atmosphere at a temperature ranging from 900° C. to 1300° C. to form an oxide layer on said implanted layer and to diffuse the impurity in the implanted layer into deeper portions of the substrate to form a junction at said deeper portions.

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**3,745,071**
**SELECTIVE LIQUID GROWTH PROCESS**
**Shigeru Mitsui, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Dec. 6, 1971, Ser. No. 205,050**
**Claims priority, application Japan, Dec. 15, 1970, 45/112,019**
**Int. Cl. H01l 7/38**
**U.S. Cl. 148—171** **4 Claims**

A coating of a metal oxide reducible to the corresponding metal in a reducing atmosphere is first disposed in a predetermined pattern on a surface of a semiconductor substrate. The oxide may be $SnO_2$, $In_2O_3$ or $Ga_2O_3$. Then the substrate is subjected to the conventional liquid growth process in an atmosphere of reducing gas such as hydrogen to selectively grow a semiconductor layer in those portions occupied by the oxide of its surface. Also there is disclosed the formation of a Gunn diode on a GaAs substrate.

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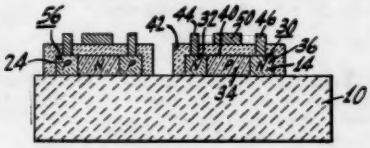
**3,745,072**
**SEMICONDUCTOR DEVICE FABRICATION**
**Joseph Hurlong Scott, Jr., Newark, N.J., assignor to RCA Corporation**
**Filed Apr. 7, 1970, Ser. No. 26,374**
**Int. Cl. H01l 7/00, 11/00**
**U.S. Cl. 148—175** **4 Claims**




A first layer of semiconductor material is provided on an insulating substrate and defined to form a first region. A masking layer is provided on the first region preferably covering all the exposed surfaces thereof. A second layer of semiconductor material, having conductivity characteristics different from that of the first layer, is formed on the first region and on the substrate. Using an etchant which does not attack the masking layer, the second layer is defined to form a second region spaced from the first region. Thereafter a component is formed within each of the two regions, the component of the first region having different electrical characteristics from the component of the second region.

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**3,745,073**
**SINGLE-STEP PROCESS FOR MAKING p-n JUNCTIONS IN ZINC SELENIDE**
**Zoltan K. Kun, Skokie, and Robert J. Robinson, Park Ridge, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.**
**No Drawing. Filed Feb. 26, 1971, Ser. No. 119,370**
**Int. Cl. H01l 7/62**
**U.S. Cl. 148—189** **1 Claim**

P-n junctions are formed by simultaneous doping of a thin surface layer of an n-type zinc selenide substrate with zinc and with gallium, indium or thallium. Doping may be effected by vapor phase in-diffusion or by submersion of the substrate in an alloy melt containing both dopants.

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**3,745,074**
**COMPOSITE SOLID PROPELLANT WITH ADDITIVE TO IMPROVE THE MECHANICAL PROPERTIES THEREOF**
**Henry C. Allen, Decatur, Ala., assignor to the United States of America as represented by the Secretary of the Army**
**No Drawing. Original application July 30, 1969, Ser. No. 851,137. Divided and this application Jan. 12, 1971, Ser. No. 105,938**
**Int. Cl. C06d 5/06**
**U.S. Cl. 149—7** **5 Claims**

The reaction products of di- or tri-functional aziridinyl phosphine oxides or their derivatives with polyfunctional

carboxylic acids, and the combination of the reaction products with other propellant ingredients such as inorganic oxidizer, binder, plasticizer, metal fuel and etc.

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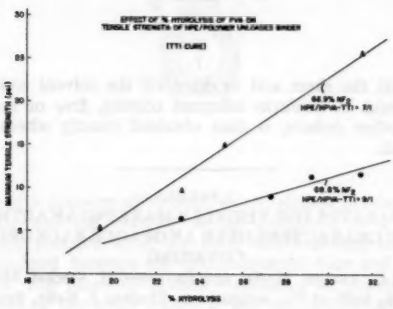
3,745,075
**HIGHLY PLASTICIZED BINDER FOR SOLID PROPELLANTS**
Adolf H. Muenker, Somerset, Leland K. Beach, Westfield, and Lawrence J. Engel, Dunellen, N.J., assignors to Esso Research and Engineering Company
Filed Sept. 11, 1964, Ser. No. 396,479
Int. Cl. C06d *5/06*
U.S. Cl. 149—19 23 Claims



A solid rocket propellant containing a highly plasticized polyurethane binder is prepared by dissolving partially hydrolyzed polyvinyl esters in an amino-fluoride, nitro- or nitrato-containing organic liquid oxidizer and reacting this with an isocyanate to form a polyurethane. The propellant contains ammonium perchlorate with a powdered metal fuel.

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3,745,076
**PROPELLANT COMPOSITION WITH A NITRO CONTAINING CROSS-LINKED BINDER**
Darrell V. Sickman, Washington, D.C., and Mortimer J. Kamlet, Silver Spring, Richard D. Rich, Takoma Park, and Harry Heller and Lloyd A. Kaplan, Silver Spring, Md., assignors to the United States of America as represented by the Secretary of the Navy
No Drawing. Continuation-in-part of abandoned application Ser. No. 509,684, Nov. 22, 1965. This application Feb. 2, 1966, Ser. No. 524,973
Int. Cl. C06b *3/00, 11/00, 15/02*
U.S. Cl. 149—19 13 Claims

A high energy propellant composition comprising a binder, oxidant, fuel and plasticizer. An energetic binder for said composition prepared by reacting a nitro or fluorodinitromethyl containing polycarboxylic acid-diol type polyester with an isocyanate or a carboxyl reactive cross-linking agent.

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3,745,077
**THERMIT COMPOSITION AND METHOD OF MAKING**
John W. Jones, Redlands, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Mar. 15, 1972, Ser. No. 234,855
Int. Cl. C06b *15/00*
U.S. Cl. 149—40 8 Claims

A thermit composition comprising a mixture of a reducing metal and inorganic oxides wherein one of the oxides is boric oxide. The mixture is heated to a point where the boric oxide is softened and acts as a binder for the reducing metal and other oxides. Pressure is applied to the mixture to form a dense, structurally strong final product which is useful as an incendiary composition.

3,745,078
**DISPERSION OF FINE AMMONIUM PERCHLORATE, ALUMINUM OR FERRIC OXIDE PARTICLES IN PROPELLANTS**
Bernard J. Alley and Herbert A. Carter, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Oct. 19, 1967, Ser. No. 677,846
Int. Cl. C06b *11/00*
U.S. Cl. 149—76 8 Claims

1. A method for dispersing fine ammonium perchlorate, aluminum or ferric oxide particles of less than 50$\mu$ weight median diameter comprising the steps of mixing a slurry of said fine ammonium perchlorate, aluminum or ferric oxide particles, an organic liquid and a surfactant, said surfactant being of about 0.1 to about 0.5 percent by weight on a total solids basis, which lowers the interfacial surface tension between said fine ammonium perchlorate, aluminum or ferric oxide particles and said organic liquid, and allowing said slurry to stand until said surfactant reacts with said ammonium perchlorate, aluminum or ferric oxide particles to effectively disperse said ammonium perchlorate, aluminum or ferric oxide particles in said slurry, said surfactant being selected from the group consisting of sodium sulfonate of mineral oil, lecithin, and a mixture consisting essentially of approximately equal parts by weight of phosphatidyl cholines, ethanolamines and inositols, and said organic liquid being selected from the group consisting of normal-heptane, normal-hexane, 1,1,2-trichloro - 1,2,2 - trifluoroethane, 1,1,2,2-tetrachloro-1,2-difluoroethane, ethyl acetate, tetrahydrofuran, benzene, toluene, hexane, acetone, and ethyl alcohol.

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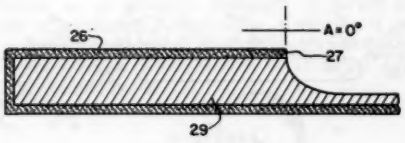
3,745,079
**CHEMICALLY MILLING TITANIUM ALLOY WORKPIECES**
Donald O. Cowles and William L. Hack, Tulsa, Okla., assignors to North American Rockwell Corporation
Filed Apr. 21, 1971, Ser. No. 136,020
Int. Cl. C23g *1/06, 1/22*
U.S. Cl. 156—18 2 Claims




Apparatus and etchant compositions are disclosed for chemically milling titanium alloy workpieces to develop recessed areas having non-undercut edge characteristics.

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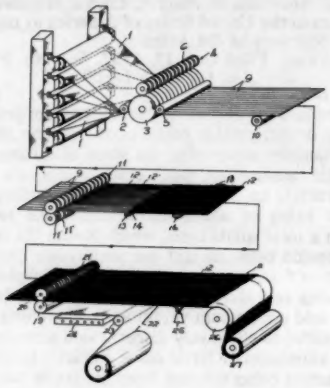
3,745,080
**METHOD OF PRODUCING PLASTIC SHEETS**
Yasuhiro Oshima, % Meiwa Gravure Chemical Co., Ltd., 860 Kashida, Higashi Osaka, Japan
Filed Sept. 4, 1970, Ser. No. 69,692
Int. Cl. B32b *31/00*
U.S. Cl. 156—154 1 Claim

In a method of the producing a nap-raised plastic sheet of high quality on a large scale and at a low cost, several thin thermoplastic resin films of same dimensions are overlapped to form a single plastic sheet and extended in the traverse direction thereof or embossed in said direction with a pattern of paralleled furrows; thereafter this plastic sheet is cut across said direction whereby the cut edges thereof are thermally sealed together by the heat produced when the sheet was cut at a high rate of speed or by the heat conducted thereto by the previously heated foremost ends of cutting blades with which the sheet is

cut. The method further involves erecting these sealed edges in an upright posture, sticking the same inseparably



to a plastic ground sheet and scratching the erected edges thereby to form a large number of flocculent nap elements.

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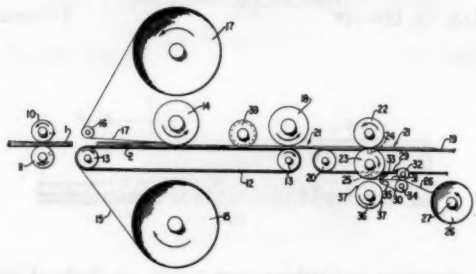
**3,745,081**
**METHOD FOR MAKING ABSORBENT PADS**
**Arthur B. Erekson, Scarsdale, N.Y., assignor to Borden Inc., New York, N.Y.**
**Original application Nov. 20, 1969, Ser. No. 878,390, now Patent No. 3,673,019. Divided and this application May 10, 1971, Ser. No. 142,033**
**Int. Cl. B32b** *31/10, 31/18*
**U.S. Cl. 156—264** **1 Claim**



This method is characterized by moving absorbent pad sections on a narrow conveyor so that the side edges of the pad sections extend beyond the conveyor and adhering strips of pressure-sensitive adhesive tape to the sides of the pad sections by means of a rotatable suction roll co-operating with a pressure roll.

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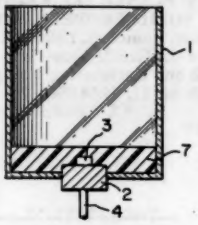
**3,745,082**
**SEMICONDUCTOR SURFACE PROTECTION MATERIAL**
**Richard D. Packard, Brighton, Mass., assignor to the United States of America as represented by the National Aeronautics and Space Administration**
**Filed June 5, 1970, Ser. No. 43,883**
**Int. Cl. H01b** *1/04*
**U.S. Cl. 156—285** **2 Claims**

A method and a product for protecting semiconductor surfaces is disclosed. The protective coating material is prepared by heating a suitable protective resin with an organic solvent which is solid at room temperature and converting the resulting solution into sheets by a conventional casting operation. Pieces of such sheets of suitable shape and thickness are placed on the semiconductor areas to be coated and heat and vacuum are then applied



to melt the sheet and to drive off the solvent and cure the resin. A uniform adherent coating, free of bubbles and other defects, is thus obtained exactly where it is desired.

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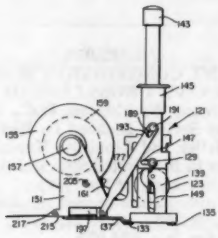
**3,745,083**
**APPARATUS FOR VISUALLY MARKING AN ARTICLE WITH CHARACTERS OVER AN OPAQUE BACKGROUND COVERING**
**David C. Aungst, Media, and Raymond H. Steckel, Milmont Park, both of Pa., assignors to Thomas J. Kelly, Broomall and Joseph M. Callanan, Springfield, Pa.**
**Continuation-in-part of Ser. No. 35,306, May 7, 1970, abandoned. This application Feb. 4, 1971, Ser. No. 112,650**
**Int. Cl. B44m** *5/00*
**U.S. Cl. 156—388** **7 Claims**



A hand-held stamping machine for rapidly placing an opaque cover on an article followed by marking the covered portion, including a stamping assembly carrying the characters to be marked and driven against the article by downward motion of the operator's hand against a handle. Obefore the stamping assembly marks characters on the article, another portion of the stamping machine is first actuated by the operator's motion against the handle to place an opaque covering on the article.

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**3,745,084**
**APPARATUS FOR RETREADING OF VEHICLE TIRES**
**Wilhelm Schelkmann, Crengeldanzstr. 85, Witten, Germany**
**Filed July 24, 1970, Ser. No. 58,107**
**Claims priority, application Germany, Nov. 10, 1969, P 19 56 391.8**
**Int. Cl. B29h** *5/04*
**U.S. Cl. 156—394** **14 Claims**

Retreading of vehicle tires is accomplished by forming an assembly consisting essentially of a tire carcass

having a circumferential face, profiled tread means of elastomeric material superimposed upon the circumferential face and a bonding material between the carcass and the tread means. The assembly is confined in a flexible fluid-tight enclosure, the interior of the enclosure is exhausted of at least the major portion of entrapped

air, and a pressure differential is established between the interior and the exterior of the enclosure in a sense exerting pressure upon the latter and expelling residual air confined between the circumferential face and tread means. The assembly is then vulcanized for permanently bonding the tread means to the circumferential face. An apparatus is also disclosed.

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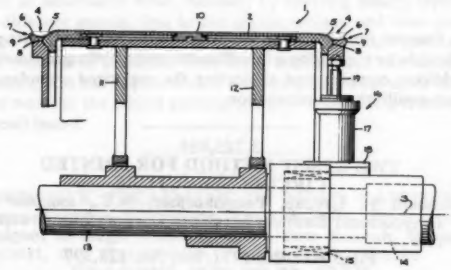
**3,745,085**
**TIRE BUILDING DRUM FOR POSITIONING A BEAD RING**

**Marcel Jean Bertrand, Grivegnee-Liege, Belgium, and Paul Heinrich Moitzheim, Laurensberg, Germany, assignors to Uniroyal A.G., Aachen-Rothe-Erde, Germany**

**Filed Jan. 6, 1971, Ser. No. 104,264**
**Claims priority, application Germany, Jan. 13, 1970, P 20 01 204.8**
**Int. Cl. B29h** *17/16, 17/22*
**U.S. Cl. 156—400** **14 Claims**

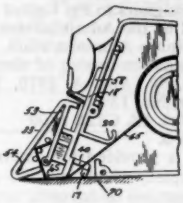


A tire building drum has adjacent respective edges of a cylindrical drum section a plurality of radially movable segments. The circumferential outer surface of the segments forms an arcuate surface. A plane of separation between the segments and the drum section edge intersects the arcuate surface at approximately the most radially inward portion of the arcuate surface. The tire building drum is particularly useful for positioning the bead wire ring during the turn-up of a metal reinforced carcass ply.

**3,745,086**
**TAPE DISPENSERS**

**Melvin A. Parker, Glen Cove, N.Y., assignor to Duron Industries, Ltd., Great Neck, N.Y.**

**Filed June 8, 1971, Ser. No. 151,126**
**Int. Cl. B32b** *31/00*
**U.S. Cl. 156—527** **10 Claims**



A dispenser having a movable applicator element which presses an adhesive tape into contact with a surface to be secured. The movable applicator element includes means for engaging the adhesive surface of such a tape in retracted position so that a fixed cutter element is enabled to sever the tape supply from the applied tape.

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**3,745,087**
**PROCESS FOR PREPARING 5'-NUCLEOTIDES**

**Shigeo Abe, Tokyo, and Akira Furuya, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan**

**No Drawing. Filed Mar. 31, 1967, Ser. No. 627,311**
**Claims priority, application Japan, Apr. 15, 1966, 41/23,564**
**Int. Cl. C12d** *13/06*
**U.S. Cl. 195—28 N** **12 Claims**

This disclosure relates to a process for producing 5'-nucleotides by fermentation using 5'-nucleotide-producing mutant strains belonging to the genus Brevibacterium or the genus Corynebacterium. The mutant strains are modified so as not to be subject to any inhibition to producing 5'-nucleotides in the presence of excess manganese. These mutant strains are obtained by ultraviolet, γ-ray or X-ray irradiation or by chemical treatment of parent strains capable of producing 5'-nucleotides. Culturing is carried out in an aqueous nutrient medium under aerobic conditions, preferably at a temperature of about 20°–40° C. and a pH of about 5–9.

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**3,745,088**
**ACTIVE WATER-INSOLUBLE ENZYMES**

**Charles L. Mehltrettter and Francis B. Weakley, Peoria, Ill., assignors to the United States of America as represented by the Secretary of Agriculture**

**No Drawing. Filed Dec. 23, 1970, Ser. No. 101,134**
**Int. Cl. C07g** *7/02*
**U.S. Cl. 195—63** **2 Claims**

Enzymes are insolubilized by coupling them to the diazotized anthranilates of modified and unmodified starch. These water-insoluble enzymes can be activated before each use by conventional means.

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**3,745,089**
**PROTEIN STERILIZATION METHOD OF FIREFLY LUCIFERASE USING REDUCED PRESSURE AND MOLECULAR SIEVES**

**Emmett W. Chappelle, Baltimore, and Edward Rich, Jr., College Park, Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration**

**No Drawing. Filed Mar. 5, 1968, Ser. No. 710,621**
**Int. Cl. C07g** *7/02*
**U.S. Cl. 195—66 R** **5 Claims**

Denaturation of the protein firefly luciferase during sterilization thereof is prevented by heating the protein in

contact with certain molecular sieves, and under a reduced pressure of the order of $5\times10^{-4}$ millimeters of mercury.

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**3,745,090**

## METHOD OF DETECTING AND COUNTING BACTERIA IN BODY FLUIDS

**Emmett W. Chappelle, Baltimore, and Grace L. Picciolo, Tantallon, Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 60,950, Aug. 4, 1970. This application Apr. 30, 1971, Ser. No. 139,250**

**Int. Cl. C12k** *1/00*

**U.S. Cl. 195—103.5 R** **21 Claims**

A novel method is provided for determining bacterial levels in urine samples, which method depends on the quantitative determination of bacterial adenosine triphosphate (ATP) in the presence of non-bacterial ATP. After the removal of non-bacterial ATP, the bacterial ATP is released by cell rupture and is measured by an enzymatic bioluminescent assay using an enzyme obtained from the firefly.

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**3,745,091**

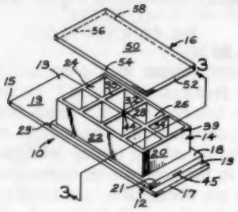
## BIOLOGICAL REACTION CHAMBER APPARATUS

**James Benjamin McCormick, Hinsdale, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Nov. 18, 1970, Ser. No. 90,748**

**Int. Cl. C12b** *1/00*

**U.S. Cl. 195—139** **3 Claims**



Biological reaction chamber apparatus having a bottom wall sidewalls which is useful, for example, to produce a tissue culture directly on a base, such as a microscope slide, for subsequent examination and storage comprises in combination a base which forms the bottom of said chamber and a receptacle removably adhesively attached in liquid-impermeable contact to said base which receptacle forms the sidewalls of said chamber. In one use of this apparatus, a liquid tissue culture medium can be placed in the receptacle chamber in contact with the base, the medium is incubated to allow the tissue culture to grow and to attach such growth to the base. The liquid medium is then removed from the chamber, and the receptacle is removed from the base. The tissue culture growth on the base can then be treated as desired and microscopically examined.

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**3,745,092**

## RECOVERY AND PURIFICATION OF ETHYLENE OXIDE BY DISTILLATION AND ABSORPTION

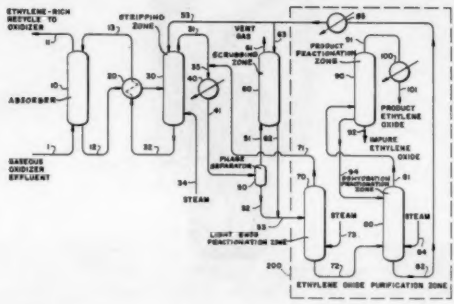
**Robert G. Vanderwater, El Cerrito, Calif., assignor to Shell Oil Company, New York, N.Y.**

**Filed Jan. 11, 1971, Ser. No. 105,205**

**Int. Cl. C07d** *1/14*

**U.S. Cl. 203—42** **4 Claims**

Ethylene oxide, produced by the direct, catalytic oxidation of ethylene, in admixture with inert gases, low molecular weight hydrocarbons, and oxides of carbon, is absorbed in an aqueous stream and stripped therefrom to produce a gaseous stripping zone overhead. The stripping zone overhead is cooled, condensing most of the water and a portion of the ethylene oxide contained therein. The cooled stripping zone overhead is phase separated, the vapor being contacted with a lean aqueous absorbent in a




scrubbing zone to recover substantially all of the ethylene oxide from the non-condensable gases. The liquid from the phase separator and the ethylene oxide-rich aqueous absorbate are joined and fed to an ethylene oxide purification zone, in which high purity ethylene oxide is recovered.

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**3,745,093**

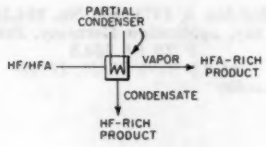
## PROCESS FOR SEPARATING HEXAFLUOROACETONE FROM HYDROGEN FLUORIDE

**Kung Hsing Lee, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.**

**Filed July 17, 1970, Ser. No. 55,652**

**Int. Cl. C07c** *49/16;* **B01d** *5/00*

**U.S. Cl. 203—49** **11 Claims**




Process for separating hexafluoroacetone from hydrogen fluoride by vaporizing a hexafluoroacetone-hydrogen fluoride addition complex and subjecting the vaporized complex to non-equilibrium condensation.

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**3,745,094**

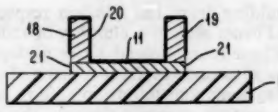
## TWO RESIST METHOD FOR PRINTED CIRCUIT STRUCTURE

**Kenneth F. Greene, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 26, 1971, Ser. No. 128,397**

**Int. Cl. H05k** *3/06*

**U.S. Cl. 204—15** **5 Claims**



An improved method is provided for plating conductive material in a predetermined pattern on a conductive

layer that is thereafter etched to the same pattern as the plated material or is etched to the pattern that extends beyond the region of plating. Two layers of photosensitive resist are applied one over the other to the conductive layer. The first or innermost resist layer is developed to mask the conductive layer in the areas that are later to be removed by etching. The second resist layer is developed to expose regions of the conductive layer that are to be plated. After the plating has been completed, the second resist is removed. The structure is then plated with an etch resistant metal in areas not masked by the first resist. The first resist is removed and the unwanted regions of the conductive layer are etched away. This method is particularly useful for plating conductive studs in a multi-layer printed circuit structure. The sides of the studs are protected by the plated resist to prevent the studs from being etched in the etch step.

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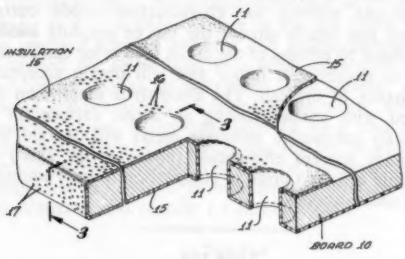
**3,745,095**
**PROCESS OF MAKING A METAL CORE PRINTED CIRCUIT BOARD**

**Donald H. Chadwick, Tulsa, Okla.; William A. Mueller, Pasadena, and Ruben T. Apodaca, Norwalk, both of Calif., assignors to International Electronic Research Corporation, Burbank, Calif.**

**Filed Jan. 26, 1971, Ser. No. 109,916**
**Int. Cl. C23b** *5/48*
**U.S. Cl. 204—15** **22 Claims**




The invention is a method for making a metal core printed circuit board which includes applying multiple layers of synthetic plastic resin material to a sheet of metal, then treating the surface of the plastic material in such a way as to provide an acceptable bond, followed by applying sundry layers of different metals, first to the plastic surface and then one upon another followed by the imposition of a circuit pattern, the removal of materials from areas intermediate the circuit pattern, and the application of an appropriate overlay of unlike metal to the circuit pattern, thereby to provide a finished circuit board.

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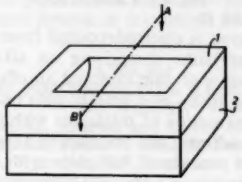
**3,745,096**
**NONSTICK TREATMENT OF MOLD CAVITIES**

**Roger Fournier, Billancourt, Hauts-de-Seine, France, assignor to Regie Nationale des Usines Renault, Billancourt, and Automobiles Peugeot, Paris, France**

**Filed Nov. 9, 1970, Ser. No. 87,738**
**Claims priority, application France, Nov. 12, 1969, 6938752**
**Int. Cl. C23b** *5/60, 5/06*
**U.S. Cl. 204—20** **1 Claim**

A method of applying a nonstick treatment to the inner surface of a mould in order to facilitate the stripping of articles of synthetic or natural material having relief designs on their surface, which is to be subsequently coated definitely or provisionally with any material to be applied closely to the aforesaid relief designs, in which there is deposited on the inner mould surface, by reduction of its salt, a chemical layer of copper, if the mould material comprises pores permitting a suitable anchoring of the metal thereto, whereafter a relatively thick base layer of metal such as copper or nickel is deposited electrolytically to reproduce very truly the mould pattern, and a fine chromium film having the desired nonstick properties is eventually formed also electrolytically thereon.

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**3,745,097**
**ELECTRODEPOSITION OF AN IRIDESCENT CHROMIUM COATING**

**Hyman Chessin and Paul D. Walker, Birmingham, Mich., assignors to M & T Chemicals Inc., New York, N.Y.**

**No Drawing. Filed May 26, 1969, Ser. No. 827,947**
**Int. Cl. C23b** *5/06*
**U.S. Cl. 204—51** **1 Claim**

This invention relates to novel compositions and to a process of preparing an iridescent chromium plated article which comprises passing current from an anode to a metal cathode through an aqueous chromium plating solution which contains at least one chromium compound providing hexavalent chromium metal ions for electroplating chromium and:

(a) as first additive composition at least one compound selected from the group consisting of an alkyl sulfonic acid, a haloalkyl sulfonic acid, an alkyl phosphonic acid, a haloalkyl phosphonic acid, and sats thereof; and

(b) as second additive composition at least one member selected from the group consisting of carboxylic acids of from 1–3 carbon atoms, halogen substituted carboxylic acids of from 1–3 carbon atoms, and salts thereof;

to produce an iridescent chromium surface on said article.

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**3,745,098**
**ELECTRODEPOSITION OF FILMS OF PARTICLES ON CATHODES**

**Henry Brown, Huntington Woods, and Thaddeus W. Tomaszewski, Dearborn, Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.**

**No Drawing. Original appplication June 19, 1969, Ser. No. 834,901. Divided and this application Sept. 29, 1971, Ser. No. 184,952**
**Int. Cl. B01k** *5/00;* **C23b** *13/00*
**U.S. Cl. 204—181** **13 Claims**

Films of discrete fine particles of inorganic and organic materials can be cathodically electrodeposited at low voltages from aqueous solutions of salts of non-plating monovalent cations such as solutions of sodium sulfate. For example, particles such as barium sulfate, boron and polyvinyl chloride can be deposited on a cathode from solutions of sodium sulfate in which the particles are dispersed. These films of particles can be used as such or can then be rinsed and transferred to plating baths and the films of particles can thus be imbedded in a metal matrix. Such 2-phase composite plates can be used for engineering purposes such as anti-friction applications, and the like, or with multiple plates to obtain excellent protection against atmospheric corrosion.

3,745,099

## ALKALINE BRIGHT ZINC ELECTROPLATING

Paul J. Szilagyi, Maple Heights, and Juan Hajdu, Rocky River, Ohio, assignors to Enthone, Incorporated, New Haven, Conn.

No Drawing. Filed June 11, 1971, Ser. No. 152,398
Int. Cl. C23b *5/10*
U.S. Cl. 204—55 R 17 Claims

Semi-bright zinc is electrodeposited from alkaline zinc electrodepositing baths comprising an alkaline solution containing a source of zinc ions and an effective amount, as a brightening agent, of a bath-soluble reaction product obtained by the reaction of melamine with formaldehyde. In another embodiment the brightening agent is the bath-soluble reaction product of melamine with formaldehyde and an epihalohydrin or a glycerol chlorohydrin. The melamine-formaldehyde reaction product and melamine-formaldehyde-epihalohydrin or melamine-formaldehyde-glycerol chlorohydrin reaction product are usually each utilized as brightener in the alkaline zinc baths in combination with a formaldehyde-acyclic amine-epihalohydrin reaction product wherein the acyclic amine has two or more functional groups.

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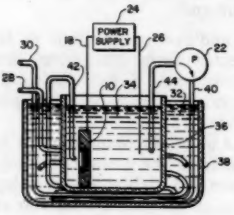
3,745,100

## METHOD OF PREPARING SEMIPOROUS FILM OF ALUMINUM OXIDE VOLTAGE ANODIZATION

Howard G. Lasser, Springfield, Va., assignor to the United States of America as represented by the Secretary of the Army

Filed Dec. 22, 1971, Ser. No. 210,909
Int. Cl. B01k *3/00*; C23b *5/68, 9/02*
U.S. Cl. 204—58 4 Claims




A method of producing a thick film of semiporous aluminum oxide on a sheet of aluminum. Pores are formed by a high voltage anodizing method that includes cooling a low concentrate oxalic acid electrolyte to a temperature of slightly above 0° centigrade and discharging this cooled electrolyte at a high flow rate on the geometric center of the aluminum sheet being anodized. Anodic voltages are initially 150 direct current (D.C.) volts and are increased in 20 volt increments for the first 5 to 10 minutes to the desired voltage for a two hour period with the electrolyte being circulated and cooled at such a rate that its temperature is about 8° centigrade at the end of the two hour period.

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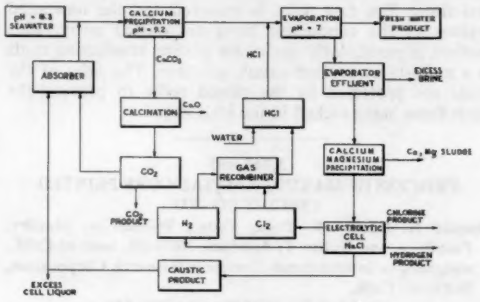
3,745,101

## ELECTROLYSIS OF DILUTE BRINE

John E. Currey, Morris P. Grotheer, and Edward H. Cook, Jr., Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of abandoned application Ser. No. 742,891, July 5, 1968. This application May 17, 1971, Ser. No. 144,208
Int. Cl. B01k *1/00*; C01d *1/06*
U.S. Cl. 204—98 8 Claims

Dilute brines are electrolyzed to produce chlorine, sodium hydroxide and hydrogen in a diaphragm type chlor-alkali cell equipped with anodes having an active surface on an electrically conductive substrate metal. Applicable substrate metals are those metals and metal alloys which are passivated when polarized anodically and remain passive well beyond the anodic potential needed to convert a chloride ion to chlorine. The active surface on the substrate metal is a noble metal, alloys thereof or noble metal oxides alone or in combination with a noble metal.




The presence of relatively high concentrations of impurities such as sodium sulfate in the dilute brine can be tolerated without the characteristic anode current efficiency loss which attends the use of graphite anodes. Up to about 50 percent of the dilute feed brine can be converted to caustic cell liquor and still obtain acceptable performance of the cell. The electrolytic diaphragm cell equipped with anodes having an active surface on an electrically conductive substrate metal will operate with high anode current efficiencies (above about 93%) on very dilute cell feed brine in comparison to cells equipped with graphite anodes.

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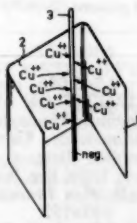
3,745,102

## FLOTATION RECOVERY OF ZINC SULPHIDE FROM ORE

Barenya Kumar Banerji, Broken Hill, New South Wales, Australia, assignor to Unisearch Limited, New South Wales, Australia

Filed Nov. 30, 1971, Ser. No. 203,463
Claims priority, application Australia, Dec. 15, 1970, 2,495/70
Int. Cl. B01k *1/00*
U.S. Cl. 204—130 3 Claims



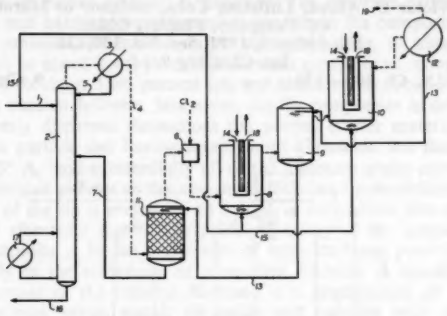

The invention relates to flotation recovery of zinc sulphide from a slurry containing zinc sulphide bearing ore in ground form by adding to the slurry a collector and then a frothing agent and passing a direct current from a low voltage source between copper electrodes through the slurry.

3,745,103

## METHOD FOR MAKING 1,1,1-TRICHLOROETHANE BY PHOTOCHEMICAL CHLORINATION OF 1,1-DICHLOROETHANE

Hermann Richtzenhain, Schwellenbach, and Rudolf Stephan, Troisdorf-Sieglar, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed May 3, 1971, Ser. No. 139,483
Claims priority, application Germany, June 1, 1970, P 20 26 671.1
Int. Cl. B01j *1/10;* C07c *17/06, 17/38*
U.S. Cl. 204—163 R 10 Claims



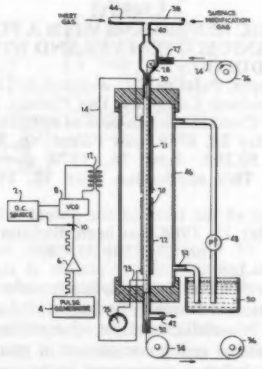
Improvements in the photochlorination of 1,1-dichloroethane to 1,1,1-trichloroethane in the gas phase wherein the reaction between chlorine and excess dichloroethane is carried out in at least two series connected reactors each of which has an ultraviolet lamp therein, which is cooled to below the reaction temperature, wherein a quench column is disposed between each two reactors, wherein the vapor product leaving the last reactor is condensed in the condenser and the condensate subjected to distillation in order to recover desired product 1,1,1-trichloroethane and recycle 1,1-dichloroethane.

3,745,104

## SURFACE MODIFICATION OF CARBON FIBERS

Kenneth C. Hou, Whippany, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 17, 1970, Ser. No. 99,169
Int. Cl. C01b *31/07*
U.S. Cl. 204—164 19 Claims



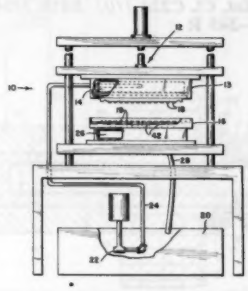
A process is provided for modifying the surface characteristics of a carbonaceous fibrous material (i.e. either amorphous carbon or graphitic carbon) and to thereby facilitate enhanced adhesion between the fibrous material and a matrix material. The carbonaceous fibrous material is contacted for relatively brief residence time with an excited gas species at a moderate temperature of about 20 to 325° C. generated by applying high frequency electrical energy in pulsed form to a gaseous mixture comprising an inert gas and a surface modification gas. Composite articles of enhanced interlaminar shear strength may be formed by incorporating the fibers modified in accordance with the present process in a resinous matrix material.

3,745,105

## APPARATUS FOR SELECTIVE ELECTROPLATING OF SHEETS

Leo N. Kosowsky, Sharon, and Curtis N. Lovejoy, Walpole, Mass., and John G. Cunniff, Foster, and Robert T. Groom, Warwick, R.I., assignors to Auric Corporation, Newark, N.J.

Filed Nov. 18, 1970, Ser. No. 90,632
Int. Cl. B23p *1/02;* B01k *3/00*
U.S. Cl. 204—224 R 13 Claims



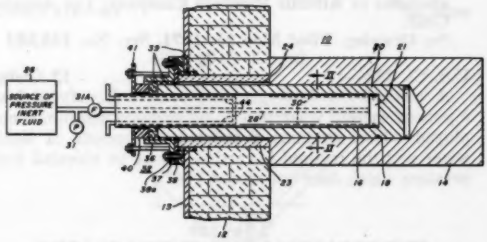
Apparatus for selectively electroplating discrete areas on a sheet employs a plurality of dams to conduct plating solution to and from the sheet. A plurality of resilient seals bearing against the material to be plated seal preselected surface portions of the sheet into contact with the fluid zone and other portions out of such contact, the seals also forming a part of a conduit normal to the preselected portions. A pump pumps plating solution through the fluid zone so as to promote turbulence adjacent the preselected surface portions.

3,745,106

## FLUID SHEATHED ELECTRODE LEAD FOR USE IN A CORROSIVE ENVIRONMENT

Stanley C. Jacobs, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 7, 1971, Ser. No. 178,282
Int. Cl. C22d *3/02;* B01k *3/04*
U.S. Cl. 204—243 R 12 Claims



An improved electrode assembly for use in an electrolytic cell perimetrically confining a corrosive fluid environment. Included therein is an electrode element exposed to said environment, at least one low resistance current carrying lead of material susceptible to deleterious attack by corrosive components of such environment

having one end traversing a wall of the cell and extending into the electrode element; the other end of the lead is disposed externally of the cell wall, and a plurality of sleeve members are disposed around a portion of the lead traversing the cell wall to inhibit contact of said corrosive components with the exterior shell of said cell and with said lead. Means are provided for maintaining a protective sheath of inert gaseous fluid surrounding the lead member, at a pressure of a magnitude sufficient to repel and thereby prevent contact of approaching corrosive component with the lead member.

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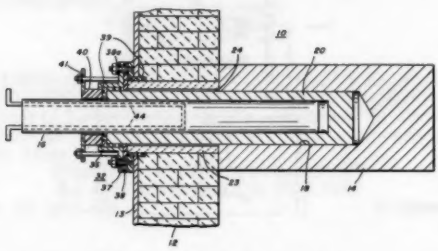
**3,745,107**
**PROTECTED ELECTRODE LEAD FOR USE IN A CORROSIVE ENVIRONMENT**
**Stanley C. Jacobs, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**
**Filed Sept. 7, 1971, Ser. No. 178,283**
**Int. Cl. C22d *3/02*; B01k *3/04***
**U.S. Cl. 204—243 R** **7 Claims**



An electrode assembly for use in an electrolytic cell having a corrosive environment comprising high temperature chlorine gas and a bath of aluminum chloride dissolved in one or more salts. The assembly comprises an electrode disposed within the cell, at least one electrical current conducting lead made of material susceptible to corrosive attack by the environment extending into the electrode, and a fluid impervious, electrically conductive sleeve disposed around the lead along at least the length thereof extending through a wall of the cell, and in contact with the electrode. The fluid impervious sleeve is effective to prevent contact of approaching corrosive constituents with the lead.

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**3,745,108**
**COAL PROCESSING**
**Seymour C. Schuman, deceased, by Elaine J. Schuman, legal representative, Princeton, N.J., and Robert W. Rieve, Springfield, and Harold Shalit, Drexel Hill, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.**
**No Drawing. Filed May 25, 1971, Ser. No. 146,803**
**Int. Cl. C10g *1/06***
**U.S. Cl. 208—10** **12 Claims**

A method for hydrogenating coal to liquefy at least a portion thereof wherein a liquid reaction medium is employed which contains a substantial amount of liquid water and the method is carried out at an elevated temperature which does not exceed 706° F.

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**3,745,109**
**HYDROCARBON CONVERSION PROCESS**
**Laszlo A. Heredy, Canoga Park, and James R. Birk, Thousand Oaks, Calif., assignors to North American Rockwell Corporation**
**Filed Oct. 1, 1970, Ser. No. 77,170**
**Int. Cl. C10g *13/02, 11/00, 9/34***
**U.S. Cl. 208—107** **12 Claims**

Hydrocarbons such as partially refined petroleum are brought into contact with a sulfide-containing alkali metal carbonate melt at elevated temperatures. Depending upon conditions, the hydrocarbons undergo thermal or catalytic cracking, hydrocracking, hydrogenation, dehydrogenation, or hydrodesulfurization. Heat is supplied to the conversion process by contacting the melt and heavy carbonaceous by-product with a reactive form of oxygen. Provision is also made for the removal of excess sulfur values.

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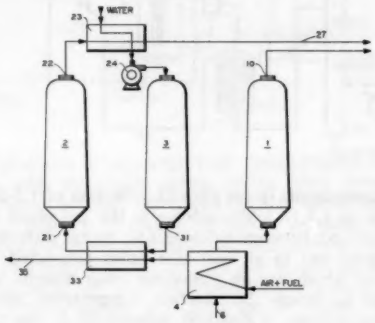
**3,745,110**
**THERMAL DECOKING OF DELAYED COKING DRUMS**
**Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findley, Ohio**
**Filed May 5, 1971, Ser. No. 140,436**
**Int. Cl. C10g *9/14***
**U.S. Cl. 208—131** **9 Claims**




After completion of the delayed coking process and before removal of the coke from the coking drum, steam or other hot gases, e.g., at 1100 to 1500° F. are circulated through the drum to shrink the coke away from the drum walls and facilitate discharge of coke from the drum. Preferably the drum tapers gradually from bottom to top and a bottom outlet of the drum communicates with a device for comminuting the coke.

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**3,745,111**
**CATALYTIC REFORMING WITH A PLATINUM-GERMANIUM CATALYST AND WITH HALOGEN ADDITION**
**John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**
**No Drawing. Continuation-in-part of applications Ser. No. 828,762, May 28, 1969, now Patent No. 3,578,584, and Ser. No. 50,295, June 26, 1970 now Patent No. 3,645,888. This application May 10, 1971, Ser. No. 141,020**
**The portion of the term of the patent subsequent to May 11, 1988, has been disclaimed**
**Int. Cl. C10g *35/08***
**U.S. Cl. 208—139** **12 Claims**

A gasoline fraction is catalytically reformed by contacting the gasoline fraction, hydrogen and a halogen additive with a bimetallic catalyst, comprising a combination of a platinum group component, a germanium component and a halogen component with a porous carrier material, at reforming conditions. Key features of the present process are: (1) use of a halogen additive in an amount of about 0.1 to 25 p.p.m. of the gasoline fraction; (2) maintenance of substantially all of the patinum group component of the catalyst in the elemental metallic state; and (3) operation with substantially all of the germanium component of the catalyst in a positive oxidation state.

3,745,112

## PLATINUM-TIN UNIFORMLY DISPERSED HYDROCARBON CONVERSION CATALYST AND PROCESS

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 807,910, Mar. 17, 1969. This application Nov. 23, 1971, Ser. No. 201,576

Int. Cl. B01j *11/08*; C10g *35/08*

U.S. Cl. 208—139 17 Claims

A catalytic composite comprising a combination of catalytically effective amounts of a platinum group component, a tin component and a halogen component with a porous carrier material is disclosed. The platinum group, tin and halogen components are present in the composite in amounts, calculated on an elemental basis, of about 0.01 to about 2 wt. percent plantinum group metal, about 0.01 to about 5 wt. percent tin, and about 0.1 to about 3.5 wt. percent halogen. Moreover, the tin component is uniformly dispersed throughout the porous carrier material in a particle size having a maximum dimension less than 100° A., and substantially all of the platinum group component is present as the elemental metal and substantially all of the tin is present in an oxidation state above that of the elemental metal. The principal utility of the subject composite is in the conversion of hydrocarbons, particularly in the reforming of a gasoline fraction. A specific example of the catalyst disclosed is a combination of a platinum group metal, tin oxide and halogen with an alumina carrier material wherein the tin oxide component is uniformly dispersed throughout the alumina carrier material in a relatively small particle size and wherein the composite contains on an elemental basis 0.01 to 2 wt. percent platinum metal, 0.01 to 5 wt. percent tin and about 0.1 to 3.5 wt. percent halogen.

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3,745,113

## BIOLOGICAL DECOMPOSITION OF ORGANIC MATERIAL

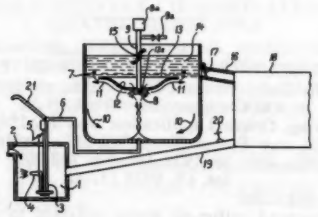
Hubert Fuchs, Mayen, Germany, assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Mar. 25, 1971, Ser. No. 128,097

Claims priority, application Sweden, Oct. 2, 1970, 13,372/70

Int. Cl. C02c *1/02*

U.S. Cl. 210—12 10 Claims



An aqueous liquid with at least 1% by weight of organic material is maintained in rotation in a treatment vessel in the presence of thermophilic microorganisms including thermophilic bacteria, there being an elapsed time of 2 to 200 seconds for each revolution of the total vessel content. Air in the form of fine bubbles is supplied to the rotating liquid in a quantity ratio of one part by volume of air to 5 to 100 parts by volume of liquid during each revolution thereof, the liquid being heated without heat addition and by the activity of the thermophilic microorganisms to a temperature of at least 42° C. where the microorganisms are active. The revolving liquid is kept heat-insulated, preferably by foam formed in the biological decomposition; and preferably both the liquid and the foam are maintained in rotation in a vertical plane and in a direction such that they move outward from the center of the vessel at the region of their inter-contacting surfaces.

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3,745,114

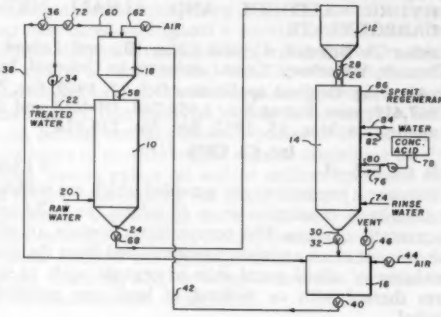
## ION EXCHANGE METHOD

Donn Lewis Dixson, East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 18, 1971, Ser. No. 172,690

Int. Cl. B01d *15/02*, *15/04*

U.S. Cl. 210—33 9 Claims




A continuous ion exchange method and apparatus together with a regeneration system is described. The ion exchange material flows continuously down through an ion exchange column while the water to be treated flows continuously up through the ion exchange material. The ion exchange material in the column is continuously replenished and the depleted exchange material is withdrawn from the bottom. The depleted resin is then regenerated and intermittently transferred back to the supply of regenerated exchange material at the top of the exchange column. Means are provided in the exchange column for accomplishing the continuous introduction of regenerated exchange material and for permitting the continuous exit of treated water.

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3,745,115

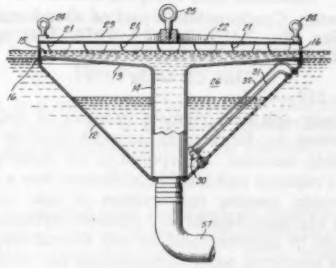
## METHOD AND APPARATUS FOR REMOVING AND RECLAIMING OIL-SLICK FROM WATER

Martin F. Olsen, 3192 Cambridge Ave., New York, N.Y.

Filed July 13, 1970, Ser. No. 54,509

Int. Cl. B01d *21/00*, *33/40*; E02b *15/04*

U.S. Cl. 210—83 6 Claims



One or more floats are provided for immersion in an oil-slick affected water area, the floats having a collecting com-

partment and a ballast compartment, and a limit valve for the ballast compartment, such that the floats will be partially submerged at the level of the collecting compartment so that the oil and water mixture may be collected. Flexible tubes are also provided for the collecting compartment for transferring the collected oil and water mixture to a separation tank. The separation tank has two ball float control valves, one of which permits the clean water to drain back into the environmental water area and the other of which permits the collected oil to be drained off for further use or refinement.

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3,745,116

## ANTISTATIC POLYMER COMPOSITION OF POLYHYDRIC ALCOHOL AND ALKALI METAL CARBOXYLATE

Gordon D. Brindell, Crystal Lake, Ill., and Leland E. Dannals, Waterbury, Conn., assignors to Uniroyal, Inc.

No Drawing. Original application Oct. 17, 1969, Ser. No. 867,410, now Patent No. 3,658,744. Divided and this application Mar. 15. 1972, Ser. No. 235,028

Int. Cl. C09k *3/16*

U.S. Cl. 252—1 5 Claims

Polymer compositions are provided which are sufficiently electrically conductive so as to inhibit the build-up of electrostatic charges. The compositions contain an effective amount of an antistatic agent selected from the group consisting of alkali metal salts of organic acids or mixtures thereof with or without at least one polyhydric alcohol.

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3,745,117

## LUBRICATING OIL COMPOSITION

Tamotsu Fujisawa, Yamato, Genichi Tsuchihashi, Tokyo, and Toshiro Takahashi, Masanobu Nakamura, and Yoshihiro Okada, Yokkaichi, Japan, assignors to Sagami Chemical Research Center and Daiko Oil Co., Ltd., both of Tokyo, Japan

No Drawing. Filed July 19, 1971, Ser. No. 164,063

Claims priority, application Japan, Dec. 29, 1970, 46/121,577

Int. Cl. C10m *1/20, 1/38*

U.S. Cl. 252—48.2 5 Claims

A high efficiency, lubricating oil composition comprises (a) a large amount of lubricating oil, (b) a 4,4'-thiobis phenol, and (c) a substituted phenol having at least one tertiary butyl group in the ortho position to the hydroxyl group. Said lubricating oil composition is, for example, a high efficiency turbine oil.

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3,745,118

## TONER COMPOSITION CONTAINING PREFORMED CARBON BLACK CORE AND PROCESS OF MAKING SAME

Carl Brynko, Oakland, N.J., assignor to Reprographic Materials, Inc., Pompton Lakes, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 2,416, Jan. 12, 1970. This application Dec. 14, 1970, Ser. No. 98,080

Int. Cl. G03g *9/02*

U.S. Cl. 252—62.1 4 Claims

Relatively spherical pigment particles of uniform size are obtained by forming an aqueous solution of a coacervatable material, incorporating an aqueous dispersion of a pigment and anionic surfactant into a coacervatable system, causing coacervation of said system and effecting agglomeration of said pigment particles. The pigments can be agglomerated to any desired size and are useful in preparing toner compositions for electrophotography. Such toners comprise a core of said uniform substantially spherical pigment particles overcoated and substantially completely surrounded by a thermoplastic resinous coating.

3,745,119

## PRODUCTION OF HIGH PURITY MOLYBDENUM USING SILVER COATED CARBON AS ADSORBENT

Hirofumi Arino, New Windsor, and Paul Mylett Madigan, Greenwood Lake, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,567

Int. Cl. C22b *59/100*

U.S. Cl. 252—301.1 R 24 Claims

High purity molybdenum, particularly radioactive molybdenum-99, is separated from acidic solution containing dissolved molybdenum along with other materials by contacting the liquid with activated carbon having a coating of silver to adsorb the molybdenum on said carbon. The molybdenum can be recovered from said carbon by eluting with an alkaline solution. The invention is useful for recovering high purity radioactive molybdenum-99 that is used to produce radiopharmaceutical generators.

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3,745,120

## NON-CORROSIVE SULFUR-LIQUID HYDROCARBON SLURRY CONTAINING AN ASPHALTENIC COMPOUND

Mary Frances Vondrak, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 772,008, Oct. 30, 1968, now Patent No. 3,597,005. This application Feb. 19, 1971, Ser. No. 117,127

Int. Cl. B01j *13/00*; C09k *3/00*

U.S. Cl. 252—309 4 Claims

An improved non-corrosive sulfur-liquid hydrocarbon slurry composition and method of preparing said slurry for transportation in suitable vehicles such as pipelines without causing plugging and corrosion.

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3,745,121

## SULFUR SLURRY PREPARATION IN PIPELINES

Lewis Philip Reiss and Frank L. Meyer, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application Dec. 18, 1968, Ser. No. 784,924, now Patent No. 3,582,146. Divided and this appplication May 6, 1971, Ser. No. 140,947

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 4 Claims

An improved sulfur-petroleum oil fraction slurry resistant to agglomeration by addition thereto of a small amount of crude oil.

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3,745,122

## SULFUR SLURRY PREPARATION IN PIPELINES

Ronald K. June, Pleasant Hill, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Original application Dec. 18, 1968, Ser. No. 784,925, now Patent No. 3,582,147. Divided and this application May 10, 1971, Ser. No. 142,009

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 6 Claims

An improved sulfur-oil slurry resistant to agglomeration by addition thereto of a small amount of an asphaltic material.

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3,745,123

## SULFUR SLURRY PREPARATION AND TRANSPORTATION IN PIPELINES

Godfrey Q. Martin, Morago, and James L. Ralph, Oakland, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application Dec. 18, 1968, Ser. No. 784,926, now Patent No. 3,582,148. Divided and this application May 10, 1971, Ser. No. 142,010

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 4 Claims

An improved sulfur-liquid petroleum fraction slurry resistant to agglomeration by addition thereto of a small

amount of a polar-containing surfactant extracted from crude oil.

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3,745,124

## SULFUR-LIQUID HYDROCARBON SLURRIES

**Charles M. Gable, Lafayette, and Ernest R. Freitas, Orinda, Calif., assignors to Shell Oil Company, New York, N.Y.**

**No Drawing. Original application Apr. 28, 1969, Ser. No. 820,012, now Patent No. 3,606,483. Divided and this application Apr. 23, 1971, Ser. No. 137,058**

**Int. Cl. B01j** *13/00;* **B27k**

**U.S. Cl. 252—309** **7 Claims**

The invention relates to an improved and novel process of preventing sulfur agglomeration, sticking, deposition and plugging of pipelines transporting sulfur in the form of a sulfur-liquid hydrocarbon slurry by adding thereto an anti-agglomerate selected from $NH_3$ and $H_2S$.

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3,745,125

## COMPOSITION AND METHOD FOR DISPERSING OILY AND TARRY RESIDUES ON SURFACES

**Giulio Marranci, Porto Torres, Gerardo Bianchi, Fertilia, and Alessandro Barbon, Rho, Milan, Italy, assignors to Societe Italiana Resine S.p.A., Milan, Italy**

**No Drawing. Filed May 11, 1971, Ser. No. 142,355**

**Claims priority, application Italy, May 12, 1970, 24,457/70**

**Int. Cl. B01f** *17/42;* **B01j** *13/00*

**U.S. Cl. 252—312** **4 Claims**

A liquid oil-soluble and water-insoluble composition useful for dispersing oily and tarry residues on surfaces consisting essentially of from 20 to 25 percent by weight, based on the weight of the composition, of the liquid nonionic surface active condensation product of nonylphenol with polyethylene glycol, said polyethylene glycol having a molecular weight of from 4,000 to 6,000 and 80 to 75 percent by weight based on the weight of the composition, of liquid alkylbenzenes consisting essentially of the bottoms fraction obtained by the catalytic alkylation of benzene with propylene, said fraction boiling at a temperature of from 200 to 205° C. and containing at least 75 percent by weight of diisopropylbenzenes.

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3,745,126

## STABLE POSITIVELY CHARGED ALUMINA COATED SILICA SOLS

**Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Continuation-in-part of application Ser. No. 745,715, July 18, 1968. This application Apr. 22, 1971, Ser. No. 136,577**

**The portion of the term of the patent subsequent to Nov. 23, 1988, has been disclaimed**

**Int. Cl. B01j** *13/00;* **B44d** *1/18;* **C01b** *33/14*

**U.S. Cl. 252—313 S** **9 Claims**

Improved positively charged coated silica particles have been prepared by reacting boric acid stabilized basic aluminum acetate with a silica sol.

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3,745,127

## COMPOSITION OF MATTER CONTAINING CARBON

**William J. Asher, Fanwood, N.J., assignor to the United States of America as represented by the Secretary of the Army**

**No Drawing. Filed Mar. 20, 1972, Ser. No. 236,170**

**Int. Cl. B01j** *11/06*

**U.S. Cl. 252—446** **3 Claims**

A new composition of matter has been made. It consists of porous carbon with a very thin layer of alumino silicate on the pore walls. The alumino silicate contains exchangeable sodium+ cations. Ion exchange can be used to change adsorption properties or load catalyst elements. These materials can be used for fuel cell electrodes, adsorbents or catalyst supports.

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3,745,128

## SODALITE-SUPPORTED CATALYST

**Lee A. Cosgrove, West Chester, and James E. McEvoy, Springfield, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**No Drawing. Filed Aug. 27, 1971, Ser. No. 175,747**

**Int. Cl. B01j** *11/40*

**U.S. Cl. 252—455 Z** **6 Claims**

Catalyst bodies comprising 0.5–45% metallic component distributed throughout a matrix in which sodalite is the predominant crystalline form are prepared by mixing raw kaolin, a finely divided metallic component, and an aqueous solution of 40–50% sodium hydroxide, shaping such mixture into catalytic bodies, immersing the bodies in oil, heating the oil-immersed bodies at 65–115° C. for 1–24 hours to provide rugged sodalite-containing catalytic bodies, rinsing excess oil and/or sodium hydroxide from the bodies, heat-treating the rinsed bodies in a controlled atmosphere, and cooling the heated bodies. These have a narrow range of sizes of macropores, and serve as crush resistant catalyst for hydrogenation, oxidation, isomerization, cracking, and/or other conversion catalyzed by the selected metallic component.

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3,745,129

## SILYL ORGANOMETALLOCENES USEFUL AS ANTIOXIDANTS

**Edgar D. Brown, Jr., 1130 N. Country Club Drive, and Abe Berger, 1504 Barclay Drive, both of Schenectady, N.Y. 12309**

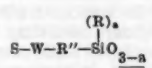
**No Drawing. Original application July 20, 1970, Ser. No. 56,681. Divided and this application Aug. 27, 1971, Ser. No. 175,757**

**Int. Cl. C10m** *1/50*

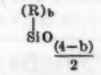
**U.S. Cl. 252—49.7** **3 Claims**

Silylorganometallocenes selected from the class of:

(a) Polymers of the formula,



(b) Copolymers having units of the formula,



and at least one unit of (a), and

(c) Disiloxanes of the formula,

$$[S—W—R''(R)_2Si]_2O$$

where R is a monovalent hydrocarbon radical, W is a carbamyl radical, R'' is a divalent hydrocarbon radical, and S is an organometallocene of the formula,

$$—[C_5Q_4]M[C_5Q_5]$$

where Q is selected from hydrogen, an electron donating organic radical, and an electron withdrawing organic radical and M is a transition metal, *a* is a whole number equal from 0 to 2 and *b* is a whole number equal from 0 to 3. These silylorganometallocenes are useful as antioxidants for organopolysiloxane fluids under extreme oxidation conditions.

3,745,130
**PERFUME COMPOSITION**
**Morris Dunkel, Paramus, N.J., assignor to Universal Oil Products Company, Des Plaines, Ill.**
**No Drawing. Continuation-in-part of application Ser. No. 811,691, Mar. 26, 1969, now Patent No. 3,663,601, which is a continuation-in-part of abandoned application Ser. No. 483,310, Aug. 27, 1965. This application Nov. 16, 1971, Ser. No. 199,298**
**Int. Cl. A61k** *7/00;* **C07c** *69/76;* **C11b** *9/00*
**U.S. Cl. 252—522** **4 Claims**

Perfume composition containing allyl beta-phenylpropionate as olfactory ingredient.

3,745,131
**PERFUMERY COMPOSITIONS**
**Anthony J. Curtis, Southsea, John F. Janes, Epping, Essex, and Brian G. Jaggers, Romford, Essex, England, assignors to Bush Boake Allen Limited, London, England**
**No Drawing. Filed Mar. 19, 1969, Ser. No. 808,665**
**Claims priority, application Great Britain, Mar. 21, 1968, 13,756/68; June 28, 1968, 31,033/68**
**Int. Cl. C11b** *9/00*
**U.S. Cl. 252—522** **21 Claims**

w-Hydroxymethyl longifolene and/or w-acyloxymethyl longifolenes wherein the acyl group has from 2 to 4 carbon atoms, preferably 2, may be used to advantage in perfumery compositions as fixatives, blending and enhancing agents.

3,745,132
**POLYMERIZATION OF ALKYLENE OXIDES WITH CATALYST COMPRISING REACTION PRODUCT OF ORGANOSTANNIC AND INORGANIC PHOSPHORUS COMPOUNDS**
**Tadahiro Go, Tatuo Usui, and Toshiko Kaitu, Yokohama, Japan, assignors to The Japanese Geon Company Ltd., Tokyo, Japan**
**No Drawing. Filed Nov. 24, 1970, Ser. No. 92,547**
**Claims priority, application Japan, Nov. 25, 1969, 44/93,926; Dec. 19, 1969, 44/101,678, 44/101,679; Dec. 26, 1969, 44/104,681**
**Int. Cl. C08g** *23/14*
**U.S. Cl. 260—2 A** **4 Claims**

A process for the preparation of alkylene oxide polymers characterized by homopolymerizing an alkylene oxide or copolymerizing alkylene oxides in the presence as catalyst of the reaction product of at least one organotin compound and at least one phosphorus compound selected from the group consisting of phosphoric acid compounds and phosphorus oxide compounds, and a process for the preparation of a catalyst for polymerizing alkylene oxides, characterized by reacting in a solvent at least one organotin compound with at least one phosphorus compound selected from the group consisting of phosphoric acid compounds and phosphorus oxide compounds.

3,745,133
**CELLULAR ISOCYANURATE CONTAINING POLYMERS**
**Giuseppe V. Comunale, Wakefield, Mass., and Herbert G. Nadeau, North Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.**
**No Drawing. Filed Feb. 5, 1968, Ser. No. 702,785**
**Int. Cl. C08g** *22/44*
**U.S. Cl. 260—2.5 AW** **11 Claims**

High temperature resistant, low flame spread cellular polymers are disclosed. These polymers are obtained by polymerizing polymethylene polyphenyl isocyanates containing 35 to 85 percent by weight of methylenebis(phenyl isocyanate) in the presence of a tertiary amine and a monomeric homocyclic polyepoxide and/or a polyol. The amount of tertiary amine employed is from about 0.01 equivalent to about 0.25 equivalent per equivalent of polyisocyanate. The amount of monomeric homocyclic polyepoxide is from about 0.0045 equivalent to about 0.5 equivalent per equivalent of polyisocyanate. The amount of polyol is from about 0.01 equivalent to about 0.3 equivalent per equivalent of polyisocyanate. The novel foams are useful in thermal insulation and like applications where resistance to extreme temperatures and low flame spread requirements must be met.

3,745,134
**RESILIENT CELLULAR POLYURETHANES**
**Walter Fensch, Hannover, Germany, assignor to BASF Wyandotte Corporation, Wyandotte, Mich.**
**No Drawing. Continuation-in-part of abandoned application Ser. No. 791,503, Jan. 15, 1969. This application Mar. 22, 1971, Ser. No. 126,973**
**Claims priority, application Germany, June 7, 1968, P 17 69 550.0**
**Int. Cl. C08g** *22/16, 22/46*
**U.S. Cl. 260—2.5 AM** **7 Claims**

A method is provided for making a resilient elastomeric cellular polyurethane having a density of at least about 25 pounds per cubic foot adapted to retain its original resiliency wherein an organic diisocyanate is reacted with a high molecular weight organic polyol, water and two organic chain extenders, one having a molecular weight below 500 and the other having a molecular weight of 500 to about 600 and containing ester and/or ether groups.

3,745,135
**POLYMERIZED ETHYLENICALLY UNSATURATED FATTY ACIDS AS EMULSIFIERS FOR AQUEOUS DISPERSIONS**
**Gerfried Pruckmayr, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**No Drawing. Filed Aug. 17, 1970, Ser. No. 64,595**
**Int. Cl. C08d** *9/14;* **C08f** *21/04*
**U.S. Cl. 260—23 EM** **11 Claims**

Aqueous dispersions of oils, waxes, resins which are liquid at the temperature at which the dispersion is formed, and inorganic particulate materials, such as metal oxides, are prepared utilizing a polymerized ethylenically unsaturated fatty acid as a surface active agent. These dispersions are storage-stable and are insensitive to pH changes caused by the presence of polyvalent inorganic anions, such as phosphates and borates.

3,745,136
**AQUEOUS DISPERSION OF MULTI-LAYERED VINYLIDENE CHLORIDE COPOLYMERS**
**Helmut Huhn, Walsrode, Horst Kuhn, Fallingbostel, and Helmut Meyer and Udo Tewes, Bomlitz, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany**
**No Drawing. Filed July 9, 1971, Ser. No. 161,283**
**Claims priority, application Germany, July 10, 1970 P 20 34 257.8–44**
**Int. Cl. C08f** *37/18, 15/40*
**U.S. Cl. 260—29.6 RB** **7 Claims**

A coating composition in the form of an aqueous dispersion for finishing cellulose-regenerates or plastics in sheet form wherein said coating material is in the form of spherical multi-layered solid particles each of which has an amorphous solid centre (a), a core (b) and a shell (c), which coating material is resistant to blocking and capable of being heat-sealed on flat surfaces.

3,745,137
**PROCESS OF PREPARING NONAQUEOUS DISPERSIONS OF THERMOSETTING COPOLYMERS**
**Carroll Glenn Reid, Louisville, Darrell D. Hicks, Jeffersontown, and Charles David Green, Louisville, Ky., assignors to Celanese Coatings Company, New York, N.Y.**
**No Drawing. Filed Oct. 26, 1971, Ser. No. 192,643**
**Int. Cl. C08f** *45/28, 47/20;* **C08g** *53/18*
**U.S. Cl. 260—33.6 UA** **13 Claims**

Nonaqueous dispersions of copolymers of (1) at least one ethylenically-unsaturated monomer, (2) a hydroxy-

alkyl ester of an unsaturated aliphatic monocarboxylic acid, and (3) a different hydroxy-containing ethylenically unsaturated monomer, which dispersions are stable per se and in the presence of aminoplast resins and solutions thereof, and the copolymers are internally compatible. The dispersions are prepared by the process which comprises first partially polymerzing a portion of at least one of the hydroxy-free and carboxy-free monomers with all of the different hydroxy-containing ethylenically unsaturated monomer, followed by adding all of the remaining monomers and holding to essentially complete conversion. The dispersions are useful in coating compositions.

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**3,745,138**

**BONDING COMPOSITION CONTAINING A BLOCKED ISOCYANATE**

**Ernest C. Koerner, Ralph W. Hall, George D. Hilker, and William W. Wareham, Fort Wayne, Ind., assignors to Phelps Dodge Magnet Wire Corporation, Fort Wayne, Ind.**

**Filed Aug. 14, 1968, Ser. No. 752,541**
**Int. Cl. C08c** *11/28*
**U.S. Cl. 260—33.4 UR** **6 Claims**

A resinous bonding composition which is a combination of a compound having a plurality of

groups where R is any aliphatic or aromatic organic radical and a thermoplastic resin having a plurality of hydroxyl groups. This resinous product is soluble in a solvent to the extent that article may be coated or impregnated with the resinous composition by conventional dipping or wiping followed by solvent evaporation. Articles coated with the resinous product can be bonded together by softening the product either by heating the resinous coating to temperatures above its softening point or by applying selective solvents to the resinous coating. The significant feature of the new resinous product is that the resinous product can then be thermoset, if desired. In specific applications, the new resinous product can be used as a magnet wire enamel and a cement for bonding coated articles into various self-supporting and integral structures for example coils made of magnet wire, and other fixed forms made of fibrous materials such as paper or cloth materials including textiles and nonwoven materials impregnated with the resinous product of this invention or further as an adhesive that can be thermoset by the method of the invention. The method of the invention, in the specific embodiment relating to magnet wire, includes the steps of combining the resin and compound above-mentioned to form a resinous product, preparing a solution of the resinous product, coating a conductor with the resinous product in a conventional manner which includes the baking of the coated conductor to remove the solvent therefrom, forming a coil of the magnet wire coated with the product, and bonding adjacent portions of magnet wire together to form a bonded coil product. This latter step can be performed by using additional solvent or by heating the coil in a selected manner which may result in the resinous product either remaining thermoplastic or becoming thermoset, as desired.

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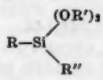
**3,745,139**

**FOUNDRY PROCESSES AND PRODUCTS**

**Victor Kachur, Bloomington, and Richard H. Toeniskoetter, Edina, Minn., assignors to Ashland Oil Inc., Houston, Tex.**

**No Drawing. Filed May 3, 1971, Ser. No. 139,907**
**Int. Cl. C08g** *51/04*
**U.S. Cl. 260—38** **10 Claims**

The overall strength of foundry cores and molds and particularly the strength of the cores and molds at high relative humidity conditions are improved by treating the foundry sand with an aqueous solution of an inorganic or organic acid and washing the sand with water before the sand is combined with a foundry binder containing a silane compound having the formula



wherein R is an organic radical, R′ is alkyl and R″ is —OR′ or alkyl.

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**3,745,140**

**SHAPABLE FIBER-REINFORCED NOVACULITE-FILLED LOW MOLECULAR WEIGHT POLYETHYLENE TEREPHTHALATE**

**Leon Segal, Morristown, N.J., assignor to Allied Chemical Corporation, New York, N.Y.**

**Filed Sept. 22, 1971, Ser. No. 182,600**
**Int. Cl. C08g** *51/04*
**U.S. Cl. 260—40 R** **8 Claims**

Glass fiber-reinforced, novaculite-filled PET composite sheets are formed using semi-crystalline PET having its glass transition temperature above room temperature. These composite sheets can be cold formed, i.e. shaped in a cold mold when preheated outside the mold, and possess physical properties superior to sheets prepared using unfilled PET or PET containing fillers other than novaculite.

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**3,745,141**

**SULPHONATED POLYETHERS**

**Lucien Bonnard and Rene Pich, Lyon, and Alain Palsky, Calvire, France, assignors to Societe Rhodiaceta, Paris, France**

**No Drawing. Original application Oct. 28, 1968, Ser. No. 771,358. Divided and this application Feb. 16, 1971, Ser. No. 115,750**
**Int. Cl. C08g** *5/00, 5/02;* **C07c** *143/50*
**U.S. Cl. 260—40 R** **12 Claims**

The invention provides novel aliphatic/aromatic polyethers containing sulphonate groups which may advantageously be incorporated in polyesters or polyamides as a dispersion or, in the case of polyesters, as part of the polymer molecule, to improve their affinity for basic dyestuffs.

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**3,745,142**

**PROCESS FOR PREPARING HIGHLY FILLED POLYOLEFINS**

**Bert H. Mahlman, West Chester, Pa., assignor to Hercules Incorporated, Wilmington, Del.**

**No Drawing. Continuation-in-part of application Ser. No. 777,198, Nov. 19, 1868, which is a continuation-in-part of application Ser. No. 694,885, Jan. 2, 1968, now abandoned. This appplication July 29, 1971, Ser. No. 167,511**
**Int. Cl. C08f** *45/04, 45/08*
**U.S. Cl. 260—41 R** **12 Claims**

A process for preparing olefin polymer compositions containing very high loadings of inorganic filler material which comprises having the olefin polymer initially present in the form of tiny submicron size particles. A uniform distribution of polymer and filler is easily achieved with this technique.

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**3,745,143**

**VULCANIZABLE OLEFIN COPOLYMERS AND PROCESS FOR THEIR PREPARATION**

**Francis Paul Baldwin, Summit, and Guido Sartori, Linden, N.J., and Jean Lefebvre, Brussels, Belgium, assignors to Esso Research and Engineering Company**

**No Drawing. Filed Mar. 27, 1972, Ser. No. 238,641**
**Claims priority, application Great Britain, Mar. 7, 1972, 238,641/72**
**Int. Cl. C08f** *15/40*
**U.S. Cl. 260—41.5 R** **15 Claims**

A new class of linear, high molecular weight copolymers of ethylene, 2.3-dimethyl-2.5-norbornadiene and

one or more alpha-olefins of the general formula $R—CH_2=CH_2$, wherein R is an alkyl containing 1–4 carbon atoms.

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3,745,144

## ZINC CHLORIDE-AMMONIUM CHLORIDE COMPLEXES AS FLAME RETARDANTS

Richard J. Gobeil, Carrcroft, and Richard N. Knowles, Hockessin, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 7, 1971, Ser. No. 187,510

Int. Cl. C08f *45/56, 51/56*

U.S. Cl. 260—45.75 R 5 Claims

Zinc chloride-ammonium chloride complexes in which the molar ratio of ammonium chloride to zinc chloride can vary within the range of 3:1 to 1:1 improve the flame retardancy of polymeric materials. These flame-retarding complexes must be used in the presence of a source of halogen.

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3,745,145

## STABILIZED MELT-PROCESSABLE ETHYLENE/CHLOROTRIFLUOROETHYLENE COPOLYMER COMPOSITIONS

Ghazi Khattab, Parsippany, and Alfred Stoloff, Livingston, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Mar. 16, 1971, Ser. No. 124,913

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 XA 16 Claims

About equimolar ethylene/chlorotrifluoroethylene copolymer compositions are stabilized against thermal degradation so as to render them melt-processable by incorporating therein a stabilizing system comprising (a) a phosphite of an organic polyhydric phenol; (b) a salt of a carboxylic acid and a metal of Group II of the Periodic Table; (c) a thio dipropionic acid ester or alkali metal salt.

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3,745,146

## FIRE RETARDANT POLYMER COMPOSITION

Anderson O. Dotson, Jr., New Brunswick, Joseph Green, East Brunswick, and Lionel T. Wolford, Freehold, N.J., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed Oct. 29, 1971, Ser. No. 194,011

Int. Cl. C08f *45/58;* C08g *51/58*

U.S. Cl. 260—45.75 B 9 Claims

Normally flammable synthetic polymers are rendered flame retardant by incorporating therein a fire retarding agent having the structure of a brominated Diels-Alder adduct of maleic anhydride and a conjugated diene, such as butadiene.

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3,745,147

## STABILIZED ORGANIC COMPOSITIONS CONTAINING HINDERED PHENOLIC THIO SUCCINATES

Eduard K. Kleiner, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application Feb. 27, 1969, Ser. No. 803,115, now Patent No. 3,636,033, dated Jan. 18, 1972. Divided and this application Apr. 28, 1971, Ser. No. 138,355

Int. Cl. C08f *45/58;* C08g *51/58*

U.S. Cl. 260—45.85 S 10 Claims

Organic materials, particularly synthetic polymers such as polypropylene, are protected against oxidation in air, thermal degradation or deterioration by including, in such substances, a stabilizing amount of an antioxidant. The antioxidant is obtained by reacting (a) an $\alpha,\beta$-unsaturated ester of a hindered hydroquinone and (b) a thio acid.

3,745,148

## STABILIZED ORGANIC COMPOSITIONS

Kju Hi Shin, Livonia, and Edward F. Zaweski, Pleasant Ridge, Mich., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Apr. 5, 1971, Ser. No. 131,512

Int. Cl. C08f *45/58;* C08g *51/58*

U.S. Cl. 260—45.95 C 7 Claims

Organic material such as styrene-butadiene rubber is stabilized against oxidative degradation by the addition of an antioxidant composition made by the process comprising (A) reacting from 1–10 moles of a monohydric alkanol containing from 1 to about 50 carbon atoms with a mole of $P_2S_5$ at a temperature of from about 75 to about 125° C. to form a dithiophosphate reaction mixture; (B) neutralizing said dithiophosphate reaction mixture with aqueous ammonia; and (C) adding from about 1 to 3 moles of a hydroxybenzyl chloride to the neutralized reaction mixture and reacting at a temperature of from about 50 to 150° C. The preferred hydroxybenzyl chloride is 3,5-di-tert-butyl-4-hydroxybenzyl chloride, and the preferred alkanol is a mixture of monohydric aliphatic $C_{20-50}$ alcohols.

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3,745,149

## PREPARATION OF POLYIMIDES FROM MIXTURES OF MONOMERIC DIAMINES AND ESTERS OF POLYCARBOXYLIC ACIDS

Tito T. Serafini, Middleburg Heights; Peter Delvigs, Fairview Park, and George R. Lightsey, Brookpark, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 29, 1971, Ser. No. 184,960

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 11 Claims

Polyimides having high thermal and oxidative stability are prepared by the reaction, with application of heat, of a mixture of monomers comprising (a) a dialkyl or tetraalkyl ester of an aromatic tetracarboxylic acid, (b) an aromatic diamine, and (c) a monoalkyl or dialkyl ester of a dicarboxylic acid wherein the ratio of a:b:c is $n$:($n$+1):2, wherein $n$ has a value of from 1 to 20. The mixture of monomers is prepared in a 30 to 70 percent by weight solution of an organic solvent, a substrate impregnated with the solution and heated at 50° to 205°C to remove said solvent and form a low molecular weight prepolymer, and thereafter heated at 275° to 350°C to cure to a high molecular weight polyimide. In a specific embodiment, graphite fiber is impregnated with a solution of 60 percent by weight of a mixture of 2,5-dicarbomethoxyterephthalic acid, methylenedianiline, and 5-norbornene-2,3-dicarboxylic acid monomethyl ester in dimethyl formamide, the impregnated fiber heated at 50° to 120°C to remove solvent, and thereafter heated at about 205°C to form imidized prepolymer and then at 315°C to form a high molecular weight thermally stable polyimide.

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3,745,150

## AMORPHOUS POLYETHYLENE TEREPHTHALATE CONTAINER AND PROCESS FOR MAKING IT

William Leonard Corsover, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 26, 1971, Ser. No. 128,402

Int. Cl. B29f *1/00*

U.S. Cl. 260—75 T 2 Claims

A container prepared from polyethylene terephthalate having an inherent viscosity of about 0.80 to 1.30 wherein the container is practically amorphous, transparent, glossy, has a shell thickness of about 30 to 90 mils and a density of about 1.3362 to 1.3381. These containers are useful

in packaging foodstuffs and, when in the shape of a bottle, they are particularly useful in bottling sodas or beer.

The containers are made by (a) forcing melt polymer through an annular die forming a tubular slug, (b) encompassing the slug with a mold maintained at a temperature no greater than about 0° C., (c) expanding the slug until it conforms to the mold thereby forming the container, (d) quenching the container against the mold for 10 to 30 seconds, (e) removing the container from the mold, and (f) post-quenching the container for at least 30 seconds in a bath maintained at a temperature no greater than about 0° C.

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3,745,151

**POLY-ε-CAPROLACTAM FILAMENT USEFUL FOR TIRE CORD**

**Hiromu Takeda, Otsu, Etsuji Oda and Rokuro Sakai, Okazaki, and Masamitsu Tanimura, Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Continuation-in-part of abandoned application Ser. No. 741,925, July 2, 1968. This application Feb. 8, 1971, Ser. No. 97,432**

**Claims priority, application Japan, July 4, 1967, 42/42,556; July 8, 1967, 42/43,786, 42/43,787**

**Int. Cl. C08g** *20/12*

**U.S. Cl. 260—78 L** **2 Claims**

Poly-ε-caprolactam filament useful for tire cord having a high tenacity and uniformity is produced by a method in which a filament spun from a poly-ε-caprolactam having a relative viscosity higher than 2.9 is immediately drawn in at least two successive stages wherein the spun filament is drawn in at least one earlier stage into a primary drawn filament having no measurable birefringence and then the primary drawn filament is further drawn to provide a selected total draw ratio. The drawn filament in at least one drawing stage has a γ-form crystalline structure content $C\gamma$ defined by $0.65 \leqq C\gamma \leqq 0.90$.

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3,745,152

**PROCESS FOR POLYMERIZING LACTAMS WITH TRITYL-4-N-TRITYL AMINO BUTYRATE**

**Aldemaro Ciaperoni and Enrico Pontoglio, Bollate, and Giovanni Cravini, Rho, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**No Drawing. Filed Mar. 17, 1971, Ser. No. 125,340**

**Claims priority, application Italy, Mar. 17, 1970, 22,100/70**

**Int. Cl. C08g** *20/16*

**U.S. Cl. 260—78 P** **4 Claims**

A process for the anionic polymerization of lactams in the presence of a tritylic derivative as polymerization activator is disclosed. The tritylic derivative, trityl-4-N-tritylaminobutyrate is a new product in the art. A process for making it is also disclosed.

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3,745,153

**PROCESS FOR THE PREPARATION OF POLYTHIOESTEROXIMES AND POLYBENZOTHIAZOLE (PBT) TYPE POLYMERS DERIVED THEREFROM**

**Carl N. Zellner, New Hope, Pa., assignor to Celanese Corporation, New York, N.Y.**

**No Drawing. Filed Oct. 30, 1970, Ser. No. 85,751**

**Int. Cl. C08g** *33/02*

**U.S. Cl. 260—79** **21 Claims**

Process for the preparation of polymers which comprises reacting at temperatures of from about 0° to about 250° C. an aromatic dithiol or its alkali metal or Group II*a* or II*b* metal di-salt with a bis(hydroxamoyl halide) or a derivative thereof to form a polythioesteroxime, which may then be subjected to ring closing conditions which may then be subjected to riny closing conditions to form polybenzothiazole (PBT) type polymers. Formation of the polythioesteroxime is preferably conducted in the presence of a solvent, which may or may not also function as an acid-acceptor; if not, then preferably also in the presence of an acid-acceptor. The preferred acid-acceptors are those which are insoluble in the reaction mixture—most preferably melamine. The ring closure may be conducted in the presence of a catalyst at temperatures of from about 0° to about 250° C. or by reaction with a sulfonyl halide at temperatures of from about 0° to about 90° C. Reactive mercapto or hydroxamoyl halide terminal groups of the polythioesteroximes, or PBT type polymers, may be reacted with other compounds or polymers which contain groups reactive therewith in order to further extend the polymer chains. In a preferred prior step, aromatic bis(hydroxamoyl halide) reactants are made by the reaction of dialkyl aromatic precursors, e.g., any of the isomers of xylene, with, e.g., nitrosyl halide.

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3,745,154

**PROCESS FOR THE POLYMERIZATION OR COPOLYMERIZATION OF ETHYLENE AND CATALYST COMPOSITIONS THEREFOR**

**Norio Kashiwa, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan**

**No Drawing. Filed Aug. 10, 1971, Ser. No. 170,632**

**Claims priority, application Japan, Aug. 11, 1970, 45/69,686**

**Int. Cl. C08f** *1/56, 3/06*

**U.S. Cl. 260—88.2 R** **9 Claims**

A process for the polymerization of ethylene or copolymerization of ethylene with another olefin in the presence of a specifically defined catalyst, as well as such catalyst per se, the catalyst comprising

(A) a carrier-supported transition metal compound catalyst component, the catalyst component being obtained by

(a) adding to a hydrocarbon solvent a finely divided solid inorganic compound carrier of magnesium or calcium and 0.05–10 millimols per gram of the inorganic compound of an organoaluminum compound, the inorganic compound carrier being insoluble in the hydrocarbon solvent,

(b) adding to the resulting mixture a halide of vanadium and a halide of titanium, the halide of titanium being added in an amount of not more than 5 mols per mol of the halide of vanadium, the sum total number of mols of vanadium and titanium being in the range of 0.001–1 mol per mol of the organic groups of the aluminum compound of (a), above, and

(c) reacting the so-formed liquid system containing finely divided solid inorganic compound carrier until substantially no free titanium and vanadium compounds are detected in the liquid phase of the system; and

(B) an organoaluminum compound catalyst component.

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3,745,155

**PURIFYING A GAMMA GLOBULIN BY CONTACTING A SOLUTION OF GAMMA GLOBULIN WITH SOLID PLASMA PROTEIN FREE OF GAMMA GLOBULIN**

**Donald A. Dahlgren, Portage, and John W. Nelson, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Filed July 23, 1971, Ser. No. 165,697**

**Int. Cl. C07g** *7/00*

**U.S. Cl. 260—112 B** **6 Claims**

Gamma globulin is purified by contact with solid plasma protein and erythrocyte stroma separated from menstruum by acrinol.

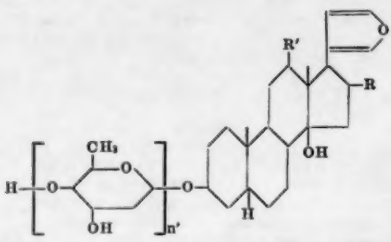
3,745,156

## NOVEL PROCESS FOR PARTIAL HYDROLYSIS OF GLYCOSIDES AND SOME PRODUCTS THEREOF

Daisuke Satoh, Nishinomiya, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 10, 1970, Ser. No. 18,337
Claims priority, application Japan, Mar. 19, 1969, 44/20,994
Int. Cl. C07c *173/00*
U.S. Cl. 260—210.5 8 Claims

Method for selective partial hydrolysis of steroid glycosides of 2-deoxy-sugar units, which comprises reacting glycol cleaving agents followed by optional reduction and mild hydrolysis, cardiotonic compounds of the formula:




wherein R and R' each represents a hydrogen atom or hydroxyl group and *n'* is an integer of 1 or 2, and esters thereof, and pharmaceutical preparations containing the compounds or products of the process of the present invention.

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3,745,157

## CYANINE DYES

Brunello Mariani and Renato Sgarbi, Milan, Italy, assignors to Ferrania, S.p.A., Milan, Italy

No Drawing. Continuation of abandoned application Ser. No. 611,489, Nov. 7, 1966. This application Feb. 11, 1971, Ser. No. 114,699
Int. Cl. C09b *23/10*
U.S. Cl. 260—240.1 10 Claims

A cyanine dye prepared from a 2-methyl benzoxazole or 2-methyl benzothiazole compound by reaction through the 2-methyl group thereof. The phenyl group of the 2-methyl benzoxazole or 2-methyl benzothiazole compound is substituted with a 2-phenyl-4-thiazolidonyl-3 radical.

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3,745,158

## ANTIVIRAL ANTIBIOTIC

Donald C. De Long, David H. Lively, and Norbert Neuss, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 18, 1967, Ser. No. 676,310
Int. Cl. C07d *95/00*
U.S. Cl. 260—243 R 3 Claims

Antiviral antibiotic complex comprising at least four factors produced by the cultivation of *Arachniotus aureus*.

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3,745,159

## 2-CARBOXY - 1 - BENZALIMINO - 1,5-DIMETHYL-2-PHENYL-3-PYRAZOLONE, ORGANIC AND INORGANIC DERIVATIVES THEREOF AND PROCESS FOR PRODUCING THE SAME

Alberto Reiner, Como, Italy, assignor to Laboratori Biochimici Fargal-Pharmasiat S.p.A., Rome, Italy

No Drawing. Filed Feb. 28, 1969, Ser. No. 803,401
Claims priority, application Italy, Feb. 28, 1968, 35,160/68
Int. Cl. C07d *49/14*
U.S. Cl. 260—240 G 1 Claim

2-carboxy-1-benzalimino-1,5-dimethyl - 2 - phenyl-3-pyrazolone and alkali and alkali earth salts thereof are prepared by the process of the invention.

3,745,160

## NOVEL BORINIUM CYANINE DYES

Daniel S. Daniel and Donald W. Haseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Sept. 23, 1968, Ser. No. 761,860, now Patent No. 3,567,439, dated Mar. 2, 1971. Divided and this application Oct. 30, 1970, Ser. No. 85,710
Int. Cl. C09b *23/00, 23/14*
U.S. Cl. 260—240 D 5 Claims

Novel methine dyes are provided which feature a 1,3,2-dioxaborinium salt moiety, a 1,3,2 - oxazaborinium salt moiety or a 1,3,2-diazaborinium salt moiety. Organic photoconductors are spectrally sensitized with the novel dyes of this invention. Novel intermediates and methods for the preparation of such intermediates are also provided.

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3,745,161

## PHENYL-HYDROXY-PYRAZINE CARBOXYLIC ACIDS AND DERIVATIVES

Tsung-Ying Shen, Gordon L. Walford, and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 836,647, June 25, 1969. This application Apr. 20, 1970, Ser. No. 30,294
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 R 7 Claims

Aryl pyrazine and pyrimidine carboxylic acids and their derivatives are described and the processes for preparing the same are disclosed. These compounds exhibit anti-inflammatory properties and also possess an effective degree of anti-pyretic and analgesic activity.

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3,745,162

## 1,2,3,4-TETRAHYDROISOQUINOLINE-2-(THIO)-CARBOXAMIDES

Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,591
Int. Cl. C07d *33/10*
U.S. Cl. 260—283 S 6 Claims

4-aryl(-4-hydroxy) - 1,2,3,4 - tetrahydroisoquinoline-2(-2-thio)-carboxamides prepared by reacting 4-aryl(-4-hydroxy) - 1,2,3,4 - tetrahydroisoquinolines with nitrourea, alkyl isocyanates, alkyl isothiocyanates, aryl isocyanates, aryl isothiocyanates and N,N - disubstituted carbamoyl halides are described. The compounds are useful as anticonvulsants.

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3,745,163

## 2,2,6,6-TETRAMETHYL PIPERIDINYL-4-(DIALKYL-HYDROXY-BENZOYL OR PHENYL ALKANOYL) HYDRAZONES

Brian Holt, Royton, Donald Richard Randell, Stockport, and James Jack, Bramhall, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Mar. 13, 1972, Ser. No. 234,333
Int. Cl. C07d *29/30*
U.S. Cl. 260—293.76 8 Claims

New acyl hydrazones of 2,2,6,6-tetramethylpiperidin-4-one are used as stabilizers for organic materials.

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3,745,164

## PREPARATION OF BUTYROLACTAM AND VALEROLACTAM

Edward G. Adamek, Toronto, Ontario, Canada, assignor to Du Pont of Canada Limited, Montreal, Quebec, Canada

No Drawing. Filed July 27, 1971, Ser. No. 166,620
Claims priority, application Canada, Aug. 28, 1970, 91,927
Int. Cl. C07d *27/08*
U.S. Cl. 260—293.52 14 Claims

The manufacture of the lactams containing 4 or 5 carbon atoms (4-butyrolactam and 5-valerolactam) in which

succinimide and glutarimide, or mixtures thereof, are reacted with hydrogen in the presence of a hydrogenation catalyst at a pressure of about from 1 to 1000 atmospheres and at a temperature of about from 230 to 300° C. in the absence of a solvent, and isolating the lactams formed.

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3,745,165

## SUBSTITUTED ISOCHROMAN OR PHTHALAN PIPERIDENES

**William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Parsippany, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.**

**No Drawing. Original application Oct. 5, 1970, Ser. No. 78,268, now Patent No. 3,686,186. Divided and this application May 22, 1972, Ser. No. 255,388**

**Int. Cl. C07d** *29/30*

**U.S. Cl. 260—293.77** **1 Claim**

Substituted isochroman or phthalan piperidenes, e.g., 1'-benzylspiro[isochroman - 3,4' - piperiden]-1-one, prepared by refluxing the corresponding 2-[substituted-4-hydroxy-4-piperidyl]-substituted benzylamide. The compounds are useful as analgesic agents.

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3,745,166

## PROCESS FOR STRIPPING HYDROGEN CYANIDE FROM PYRIDINE SALT SOLUTIONS

**William J. Didycz, Whitehall, Pa., assignor to United States Steel Corporation**

**No Drawing. Filed Apr. 15, 1971, Ser. No. 134,425**

**Int. Cl. C07d** *31/18*

**U.S. Cl. 260—296 D** **4 Claims**

A process for the removal of HCN from streams containing pyridine salts comprising contacting the HCN rich stream with a hydrogen and methane rich gas.

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3,745,167

## 3a,12b - DIHYDRO - 8H - DIBENZO[3,4,6,7]CYCLOHEPT[1,2-d]OXAZOL - 8 - ONES AND PROCESSES FOR THEIR PREPARATION

**Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.**

**No Drawing. Original application Mar. 19, 1968, Ser. No. 714,320, now Patent No. 3,625,942, dated Dec. 7, 1971. Divided and this application Feb. 25, 1971, Ser. No. 119,055**

**Int. Cl. C07d** *85/48*

**U.S. Cl. 260—307 D** **9 Claims**

3a,12b-dihydro - 8H - dibenzo[3,4,6,7]cyclohept[1,2-d] oxazol-8-ones having at the 2-position an alkylated amino group and 2,3,3a,12b-tetrahydro - 8H - dibenzo[3,4,6,7] cyclohept[1,2-d]oxazol-2-ones having at the 2-position an alkylated imino group are prepared, inter alia, by reacting a corresponding dibenzo-cycloheptoxazole compound having at the 2-position an unsubstituted amino, an alkyl substituted mercapto, an unsubstituted imino or a thioxo group, with an appropriate amine. The compounds of the invention are useful, for example, as antidepressant agents.

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3,745,168

## 5-ALKOXY-5-CHLOROMETHLOXAZOLINES

**Richard F. Merritt, Fort Washington, and Richard W. Nichols, Andalusia, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**No Drawing. Filed Dec. 3, 1971, Ser. No. 204,716**

**Int. Cl. C07d** *85/36*

**U.S. Cl. 260—307 F** **6 Claims**

2-(3,5-dichlorophenyl)-4,4-dimethyl - 5-alkoxy-5-chloromethyloxazolines and their acid salts. These compounds possess herbicidal activity.

3,745,169

## HYDROLYZING FLUORODIAZADIENES TO FORM N,N'-FLUOROALIPHATIC-SUBSTITUTED UREAS

**Paul H. Ogden, Woodbury Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**No Drawing. Continuation-in-part of application Ser. No. 627,609, Apr. 13, 1967. This application June 29, 1970, Ser. No. 51,017**

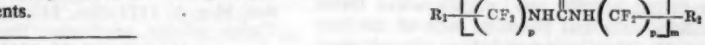
**Int. Cl. C07d** *49/30;* **C08g** *22/02*

**U.S. Cl. 260—309.7** **9 Claims**

This invention relates to a novel process for hydrolyzing fluorodiazadienes, such as

$$CF_2{=}N(CF_2)_nN{=}CF_2$$

or $CF_2{=}N(CFXCFY)_nN{=}CF_2$, where X and Y are each fluorine or a lower perfluoroalkyl group, and $n$ represents an integer between 1 and about 20, inclusive, and to the novel N,N'-fluoroaliphatic-substituted ureas of the formula



where $R_1$ and $R_2$ are fluoroaliphatic radicals, such as trifluoromethyl, $-CF_3$, or $R_1$ and $R_2$ together can form part of a fluoroalicyclic (preferably perfluoroalicyclic) ring made up of carbon and nitrogen atoms, preferably a imidazolidone ring, or $R_1$ and $R_2$ are terminal groups which are residues of a hydrolyzed azomethine group, $p$ is zero and $m$ is 1 when $R_1$ and $R_2$ are said fluoroaliphatic radicals or together form said fluoroalicyclic ring, or $p$ is an integer, preferably 2 to 10, inclusive, and $m$ is an integer of 5 to 100 inclusive, when $R_1$ and $R_2$ are said residues of hydrolyzed azomethine.

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3,745,170

## NOVEL N-(3,5-DIHALOPHENYL)-IMIDE COMPOUNDS

**Akira Fujinami, Ashiya, Toshiaki Ozaki, Toyonaka, Shigehiro Ooba, Takarazuka, Sigeo Yamamoto, Toyonaka, Katsuji Nodera, Nishinomiya, Katsutoshi Tanaka, Takarazuka, Keiichiro Akiba, Ikeda, Tadashi Ooishi, Minoo, and Nobuyuki Kameda, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan**

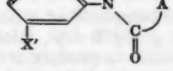
**No Drawing. Filed Mar. 6, 1970, Ser. No. 17,339**

**Claims priority, application Japan, Mar. 19, 1969, 44/21,529; Apr. 2, 1969, 44/25,795; Apr. 11, 1969, 44/28,585; Apr. 19, 1969, 44/30,455; May 9, 1969, 44/35,919; May 27, 1969, 44/41,504; May 28, 1969, 44/41,874**

**Int. Cl. C07d** *29/10*

**U.S. Cl. 260—326.5 S** **6 Claims**

Novel N-(3,5-dihalophenyl)imide compounds, which exhibit a strong antimicrobial activity against microorganisms including phytopathogenic fungi, parasites of industrial products and pathogenic microorganisms, represented by the formula,



wherein X and X' each represent halogens and A represents a substituted ethylene such as chloroethylene, $C_1$–$C_4$ alkylthioethylene, $C_1$–$C_2$ alkyl-ethylene or 1,2-di-$C_1$–

$C_3$-alkyl-ethylene, a cyclopropylene such as 1,3-dimethylcyclopropylene, trimethylene, a cyclohexylene-1,2-, cyclohexenylene-1,2-, cyclohexadienylene-1,2- or o-phenylene.

The N-(3,5-dihalophenyl)imide compounds can be obtained by any of methods which produce imide compounds or reaction of an N-(3,5-dihalophenyl)maleimide compound with a mercaptan, a hydrogen halide, phosphorus chloride or thionylchloride.

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3,745,171

## 1-(PENTYL OR HEXYL)-3-ALKYL-3-(m-HYDROXYPHENYL)-PYRROLIDINES

**Ian Moyle Lockhart, Egham, England, assignor to Parke, Davis & Company, Detroit, Mich.**

**No Drawing. Filed Oct. 12, 1970, Ser. No. 80,238**

**Claims priority, application Great Britain, July 24, 1970, 36,126/70**

**Int. Cl. C07d** *27/04*

**U.S. Cl. 260—326.5 M** **4 Claims**

m-(3-alkyl - 3 - pyrrolidinyl)phenol compounds substituted at the 1-position of the pyrrolidine ring by pentyl or hexyl; including racemic and optically active forms; and acid-addition salts and phenolate salts of the foregoing compounds. These compounds have pharmacological properties, especially as analgesic agents. They can be prepared by cleavage of the phenolic ethers. They can also be prepared by reduction of the 1-pentanoyl or 1-hexanoyl compounds, for example, by reaction with lithium aluminum hydride followed by hydrolysis of the product.

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3,745,172

## 1-[DI-(LOWER-ALKYL)AMINOALKYLAMINO]-9-OXOTHIOXANTHENES

**Joseph C. Collins and David Rosi, East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**No Drawing. Filed Oct. 5, 1970, Ser. No. 78,224**

**Int. Cl. A61k** *27/00;* **C07d** *65/18*

**U.S. Cl. 260—328** **6 Claims**

A process which comprises reacting 1-[di(lower-alkyl) amino - Y - amino]-9-oxothioxanthene-4-carboxaldehyde aldoxime, where Y is lower-alkylene, with a lower-alkanoylating agent to produce 1-[di-(lower-alkyl)-amino-Y-amino] - 9 - oxothioxanthene - 4-carboxaldehyde (lower-alkanoyl)aldoxime, heating said (lower-alkanoyl)aldoxime to produce 1 - [di - (lower-alkyl)amino-Y-amino]-9-oxothioxanthene-4-carbonitrile, heating said 4-carbonitrile in an aqueous acidic medium to produce 1-[di-(lower-alkyl) - amino-Y-amino]thioxanthen-9-one, intermediates in the synthesis of known schistosomacidal agents.

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3,745,173

## PRODUCTION OF CARBOXYLIC ACIDS, ESTERS, ACID CHLORIDES, ANHYDRIDES, AND KETONES BY REACTION OF AN ORGANOMETALLIC COMPOUND WITH CARBON MONOXIDE

**Patrick M. Henry, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**No Drawing. Continuation-in-part of application Ser. No. 625,021, Mar. 22, 1967, which is a continuation-in-part of application Ser. No. 479,662, Aug. 13, 1965. This application July 31, 1970, Ser. No. 60,148**

**Int. Cl. C07d** *5/26, 63/16*

**U.S. Cl. 260—332.2 C** **18 Claims**

An organometal compound of a platinum group metal where the organo group is aryl, thienyl, or furyl reacts with carbon monoxide to produce a diorganoketone and a carboxylic compound which is an acid anhydride, an acid or an ester and the organometal compound can be made in situ from the corresponding organomercury compound for this purpose.

3,745,174

## ISOINDOLE DERIVATIVES AND PREPARATION THEREOF

**Roger Frederick Challis Brown, and Reginald James Smith, Mount Waverley, Victoria, Australia, assignors to Monash University, Clayton, Victoria, Australia**

**No Drawing. Filed Sept. 16, 1970, Ser. No. 72,816**

**Claims priority, application Australia, Sept. 23, 1969, 61,255/69**

**Int. Cl. C07d** *27/54*

**U.S. Cl. 260—326.1** **7 Claims**

A new compound, 1-cyanoisoindole, is prepared from 3-aminoisoquinoline via new intermediates, typically by treatment with ethyl chloroformate to produce 3-ethoxycarbonyl aminoisoquinoline, oxidation to the 2-oxide thereof, then ring-contraction by pyrolysis.

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3,745,175

## 3-ALKOXY-THIA NAPHTHENE-2-CARBOXAMIDES

**Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de L'Ile-de France, Paris, France**

**No Drawing. Continuation-in-part of application Ser. No. 845,509, July 28, 1969, now abandoned. This application May 5, 1971, Ser. No. 140,605**

**Claims priority, application France, July 29, 1968, 161,060; Oct. 28, 1968, 171,684**

**Int. Cl. C07d** *63/18, 27/04*

**U.S. Cl. 260—326.3** **10 Claims**

The 3-alkoxy-thianaphthenes-2-carboxamides of this invention are effective for the treatment of mammals afflicted with emesis. When administered to dogs in dosages of 250 $\mu$g./kg., compounds of this invention give 100% protection against vomiting normally induced by subcustaneous administration of apomorphine. The compounds of this invention also favorably modify behavior disturbances in mammals.

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3,745,176

## BENZO (BETA) PYRYLIUM DYE SALTS

**Patrick J. Grisdale, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Original application Mar. 2, 1970, Ser. No. 15,832, now Patent No. 3,694,462. Divided and this application Oct. 21, 1971, Ser. No. 191,563**

**Int. Cl. C07d** *7/24*

**U.S. Cl. 260—335** **3 Claims**

A class of novel benzo[b]pyrylium dye salts having a partially saturated, bicyclic ring system fused thereto is described.

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3,745,177

## 2-FERROCENYLTETRAHYDROFURAN

**Orval E. Ayers, Huntsville, and Dennis C. Van Landuyt, Auburn, Ala., assignors to the United States of America as represented by the Secretary of the Army**

**No Drawing. Filed June 15, 1971, Ser. No. 155,673**

**Int. Cl. C07d** *5/04*

**U.S. Cl. 260—346.1 M** **1 Claim**

The compound 2-ferrocenyltetrahydrofuran for use in solid propellant compositions as a ballistic modifier. This ballistic modifier, when used in propellant compositions, increases the burning rate and improves the performance of the particular solid propellant composition in which it is incorporated.

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3,745,178

## PROCESS FOR PROSTAGLANDIN INTERMEDIATE

**David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Filed July 2, 1971, Ser. No. 159,469**

**Int. Cl. C07d** *1/20, 1/22*

**U.S. Cl. 260—348.5 L** **7 Claims**

Epoxidation of prostaglandin $A_2$ compounds with hydrogen peroxide or an organic tertiary hydroperoxide in the presence of a base consisting of lithium hydroxide,

or a lithium or magnesium alkoxide in a temperature range of −60° C. to −10° C. yields an intermediate useful for the preparation of prostaglandin $E_2$ compounds. The prostaglandin products have pharmacological utility.

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3,745,179

**DIENE SYNTHESIS USING ISOPRENE AND CITRACONIC ACID ANHYDRIDE, AND HYDROGENATION OF SYNTHESIS PRODUCT**

**Gunther Ibing, Gladbeck, and Kurt Neubold and Herbert Haferkorn, Bottrop, Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany**

**No Drawing. Filed Oct. 29, 1969, Ser. No. 872,350**

**Int. Cl. C07c *61/28***

**U.S. Cl. 260—346.6** **7 Claims**

A diene synthesis using isoprene and citraconic acid anhydride as reactants to produce an isomeric mixture of dimethyltetrahydrophthalic acid anhydrides, which can be hydrogenated to produce an isomeric mixture of the corresponding hexahydro compounds. The compounds produced are liquid hardeners for epoxy resins.

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3,745,180

**OXIDATION OF ORGANIC MATERIALS**

**Robert Allan Campbell Rennie, Runcorn, England, assignor to Imperial Chemical Industries, Limited, London, England**

**Filed Oct. 14, 1968, Ser. No. 767,189**

**Claims priority, application Great Britain, Oct. 23, 1967, 48,091/67**

**Int. Cl. C07c *49/66***

**U.S. Cl. 260—396 N** **10 Claims**

A process for reducing or oxidizing a substantially water-immiscible organic substrate by contacting a reagent comprising an aqueous solution of a compound of variable valency element, in which the variable valency element is in an appropriate oxidation state, with a solution of the organic substrate in a non-reactive, water-immiscible solvent, separating the two phases after reaction, and regenerating the reagent by electrolysis.

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3,745,181

**PROCESS FOR THE PREPARATION OF SURFACTANTS**

**Arthur N. Wrigley, Glenside, Raymond G. Bistline, Jr., Philadelphia, Edward S. Rothman, North Hills, Samuel Serota, Philadelphia, and Alexander J. Stirton, deceased, by Margaret H. Stirton, executrix, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture**

**No Drawing. Filed June 28, 1971, Ser. No. 157,761**

**Int. Cl. C07c *143/12, 143/52***

**U.S. Cl. 260—400** **17 Claims**

The 2-sulfoethyl esters and N-methyl-N-(2-sulfoethyl) amides of a number of fatty acids such as pelargonic, lauric, myristic, palmitic, stearic, oleic, phenylstearic, and tallow fatty acids were prepared by acylation of sodium isethionate and N-methyltaurine, respectively with the corresponding isopropenyl fatty ester. Products of high purity were obtained in good yield in reaction times of 10 to 90 minutes and at a temperature from 125° C. to 200° C. The products are known to be good surfactants.

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3,745,182

**PROCESS OF PRODUCING TEREPHTHALIC ACID REACTION PRODUCTS**

**John Kollar, Wyckoff, and Judd Posner, Hackensack, N.J., assignors to Halcon International, Inc.**

**Filed Apr. 30, 1971, Ser. No. 139,084**

**Int. Cl. C07c *69/82***

**U.S. Cl. 260—475 P** **7 Claims**

Terephthalic acid and lower carboxylate esters of ethylene glycol are reacted in an acidolysis zone, the reaction product is removed from the acidolysis zone and separated into a portion comprising lower carboxylate esters of (hydroxyethyl) terephthalate and a less volatile portion comprising oligomers of said lower carboxylate esters of (hydroxyethyl) terephthalate, and at least part of said less volatile material is returned to said acidolysis zone.

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3,745,183

**PROCESS FOR PRODUCING ALKYL TIN HALIDES**

**Tatsuo Katsumura, Osaka-fu, Tetsuya Matsunaga, Fuseshi, Osaka, and Tadasu Tahara, Konohana-ku, Osaka, Japan, and Reiichi Suzuki, Cambridge, Mass., assignors to Nitto Chemical Industries Co., Ltd., Osaka, Japan**

**No Drawing. Filed Apr. 17, 1964, Ser. No. 360,732**

**Claims priority, application Japan, Apr. 18, 1963, 38/19,787**

**Int. Cl. C07f *7/22***

**U.S. Cl. 260—429.7** **23 Claims**

According to one of its aspects, this invention relates to a process for producing alkyl tin halides having the general formula $R_mSnX_{4-m}$ wherein R is an alkyl radical containing 1–12 carbon atoms, X is an active halogen atom, and *m* is an integer 1–3, which comprises reacting metallic tin with an alkyl halide having the general formula RX, wherein R and X are as hereinbefore indicated, said reaction being effected in the presence of catalytic amounts of (a) at least one compound selected from the group consisting of nitrogen-containing organic compounds, phosphorus-containing organic compounds, ammonia, hydrazine, hydroxylamine, and salts thereof, and (b) at least one iodine-containing compound.

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3,745,184

**THERMAL STABILIZATION OF TETRAMETHYLLEAD**

**Shirl E. Cook and Thomas O. Sistrunk, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of applications Ser. No. 809,609, Apr. 29, 1959, Ser. No. 41,783, July 11, 1969, Ser. No. 91,598, Feb. 27, 1961, and Ser. No. 104,773, Apr. 24, 1961. This application June 8, 1962, Ser. No. 200,965**

**Int. Cl. C07f *7/24***

**U.S. Cl. 260—437 S** **39 Claims**

Tetramethyllead antiknock compositions having markedly enhanced thermal stability by virtue of the utilization therein of particular combinations of highly effective additives.

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3,745,185

**THERMAL STABILIZATION OF TETRAMETHYLLEAD**

**Shirl E. Cook, Baton Rouge, La., and Thomas O. Sistrunk, Southfield, Mich., assignors to Ethyl Corporation, New York, N.Y.**

**No Drawing. Continuation of application Ser. No. 200,965, June 8, 1962, which is a continuation-in-part of applications Ser. No. 809,609, Apr. 29, 1959, now Patent No. 3,049,558, dated Aug. 14, 1962, Ser. No. 41,783, July 11, 1960, now abandoned, Ser. No. 91,598, Feb. 27, 1961, now abandoned, and Ser. No. 104,773, Apr. 24, 1961, now abandoned. This application Mar. 3, 1972, Ser. No. 231,717**

**Int. Cl. C07f *7/24***

**U.S. Cl. 260—437 S** **15 Claims**

Tetramethyllead in concentrated form, especially when under confinement, is stabilized against pronounced thermal decomposition at elevated temperatures by maintaining it in intimate contact with suitable amounts of certain hydrocarbons (B.P. ca. 90–150° C.) such as toluene and isooctane. Equimolar tetramethyllead-ethylene dibromide concentrates violently exploded when heated under confinement to 295–305° C. Inclusion of the hydrocarbon in appropriate concentrations, in some cases with ethylene dichloride replacing part of the ethylene dibromide, eliminated this explosive decomposition and raised the temperature at which pronounced, non-explosive thermal decomposition commenced.

## 3,745,186
## OXIMINO PHOSPHORUS COMPOUNDS

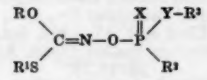
**Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.**

**No Drawing. Original application Apr. 6, 1970, Ser. No. 26,070. Divided and this application Jan. 20, 1972, Ser. No. 219,565**

**Int. Cl. C07f** *9/14;* **C07c** *119/00*

**U.S. Cl. 260—453 R** **1 Claim**

Compounds having the formula



in which X is oxygen or sulfur; Y is oxygen or sulfur; R is alkyl; $R^1$ is alkyl; $R^2$ is alkyl or alkoxy and $R^3$ is (1) phenyl, or (2) mono-, di- or tri-substituted phenyl wherein the substituent is (a) nitro or (b) halogen, and their use as insecticides, and acaricides are disclosed. Also, the intermediates for preparing the compounds and a method for preparing the intermediates are disclosed.

## 3,745,187
## BIS-THIOUREIDO-BENZENES AND PREPARATION THEREOF

**Teruhisa Noguchi, Keisuke Kohmoto, Yasushi Yasuda, and Sho Hashimoto, Kanagawa, Kinpei Kato, Tokyo, and Koshin Miyazaki and Daigaku Takiguchi, Toyama, Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan**

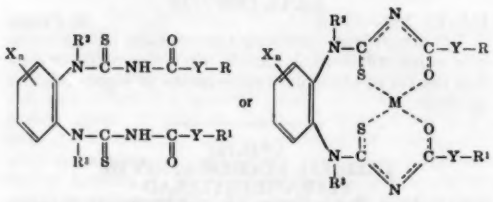
**No Drawing. Original application Oct. 28, 1968, Ser. No. 771,269. Divided and this application Oct. 21, 1971, Ser. No. 191,496**

**Claims priority, application Japan, Oct. 30, 1967, 42/69,358; Dec. 27, 1967, 43/83,295; Apr. 13, 1968, 43/24,528; Apr. 19, 1968, 43/25,829; June 18, 1968, 43/41,587, 43/41,589**

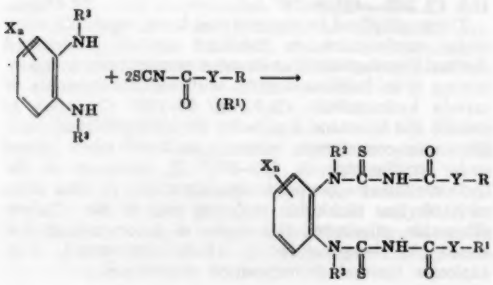
**Int. Cl. C07c** *125/00, 155/02*

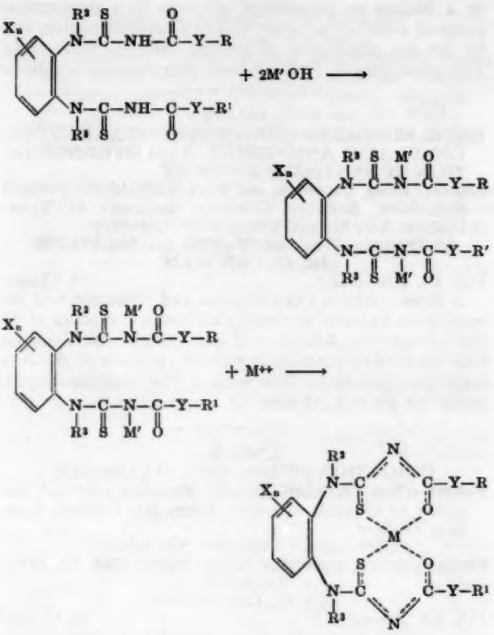
**U.S. Cl. 260—455 A** **1 Claim**

The compounds having either formula



(wherein each of R and $R^1$ represents alkyl of 1 to 12 carbon atoms, alkyl of 1 to 2 carbon atoms substituted with halogen, methoxy or phenyl, alkenyl having 2 to 3 carbon atoms, alkynyl having 2 to 3 carbon atoms, aryl or aryl substituted with halogen, nitro or methyl; each of $R^2$ and $R^3$ represents hydrogen or methyl; X represents halogen, nitro or methyl; *n* represents integer of 0–3; Y represents oxygen or sulfur and M represents metal) are prepared in accordance with the following equations:





wherein M′ represents alkali metal atom and the novel compounds have broad fungicidal activity with very low mammalian toxicity.

## 3,745,188
## PREPARATION OF NITROBENZYL ALCOHOL MESYLATES AND TOSYLATES

**Edmond M. Bottorff, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**No Drawing. Filed Apr. 19, 1971, Ser. No. 135,479**

**Int. Cl. C07c** *143/68*

**U.S. Cl. 260—456 R** **3 Claims**

Mesylates and tosylates of o-, m-, and p-nitrobenzyl alcohols are prepared in high yields by reacting the nitrobenzyl alcohol with methanesulfonyl chloride or p-toluenesulfonyl chloride in acetone in the presence of dicyclohexylamine.

## 3,745,189
## PROCESS FOR THE CONTINUOUS PRODUCTION OF PSEUDOIONONES

**Werner Hoffmann, Heinrich Pasedach, and Roman Fischer, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed Sept. 15, 1969, Ser. No. 858,178**

**Claims priority, application Germany, Sept. 18, 1968, P 17 93 445.1**

**Int. Cl. C07c** *49/20, 49/24*

**U.S. Cl. 260—593 R** **5 Claims**

Production of pseudoionones having the general formula: $CH_3—C(CH_3)=CR^2—A$;

$$CH_2=C(CH_3)—CHR^2—A$$

and $R^3OC(CH_3)_2—CHR^2—A$ by reaction of dehydrolinalools $CH_3—C(CH_3)=CR^2—B$;

$$CH=C(CH_3)—CHR^2—B$$

and $R^3OC(CH_3)_2—CHR^2—B$ with an acetoacetic ester $CH_3—CO—CHR^1—COOR^3$ (with A denoting

$—CH_2—CH_2—C(CH_3)=CH—CH=CHR^1—CO—CH_3$;

B denoting $-CH_2-CH_2-C(CH_3)(OH)-C\equiv CH$; $R^1$ and $R^2$ denoting H or $CH_3$; and $R^3$ denoting an alkyl group) by continuous reaction in at least two vessels arranged in series, the residence times in the vessels being about equal and the reaction temperatures rising in each case by from 1° to 50° C. from vessel to vessel, the temperature in the first vessel being from 160° to 190° C.

The products are valuable perfumes and intermediates for the synthesis of compounds of the vitamin-A and carotenoid series.

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3,745,190

## STABILIZATION OF AQUEOUS FORMALDEHYDE SOLUTIONS

**Roy H. Prinz, Robstown, and Bob C. Kerr, Kingsville, Tex., assignors to Celanese Corporation, New York, N.Y.**

**No Drawing. Division of application Ser. No. 690,059, Dec. 13, 1967, which is a continuation-in-part of application Ser. No. 360,137, Apr. 15, 1964, which is a continuation-in-part of application Ser. No. 77,525, Dec. 22, 1960, which in turn is a continuation-in-part of applications Ser. No. 858,868, Dec. 11, 1959, all now abandoned, Ser. No. 811,250, May 18, 1959, now Patent No. 3,137,736, and Ser. No. 744,059, June 24, 1958, now abandoned. This application Jan. 5, 1970, Ser. No. 5,408**

**Int. Cl. C07c *47/04***

**U.S. Cl. 260—606** **1 Claim**

One aspect of this invention relates to the stabilization of aqueous solutions of formaldehyde with a small amount of a sorbitan ester of a higher fatty acid.

Another aspect of the invention includes the heat treatment of an aqueous formaldehyde solution containing a small amount of any of certain dissolved organic colloids as a stabilizer, to further increase the stabilization of the solution.

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3,745,191

## FLAME-RESISTANT ORGANIC TEXTILES THROUGH TREATMENT WITH HALOGEN CONTAINING SOLUBLE METHYLOL PHOSPHINE ADDUCTS

**Donald J. Daigle, New Orleans, and Wilson S. Reeves and George L. Drake, Jr., Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture**

**No Drawing. Filed May 7, 1971, Ser. No. 141,447**

**Int. Cl. C07f *9/50***

**U.S. Cl. 260—606.5 P** **6 Claims**

Soluble methylol phosphine adducts which contain halogen atoms attached to aromatic carbon atoms are prepared by reacting tris(hydroxymethyl)phosphine with halogen substituted phenols which contain one or more hydrogens ortho or para to the phenolic hydroxyl group. These adducts are convenient and useful for (a) the preparation of flame-resistant polymers and (b) the preparation of flame- and glow-resistant organic fibrous materials and flame-, glow-, wrinkle-, and shrink-resistant woven and knit textiles which contain about 25% or more cellulosic fibers.

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3,745,192

## LOW MOLECULAR WEIGHT HALOGEN-CONTAINING COPOLYMERS

**Frank Wingler, Leverkusen, and Herbert Bartl, Odenthal-Hahnenberg, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Mar. 11, 1970, Ser. No. 18,719**

**Claims priority, application Germany, Mar. 27, 1969, P 19 15 682.2**

**Int. Cl. C07c *41/06, 43/00, 43/14***

**U.S. Cl. 260—615 P** **4 Claims**

Copolymers with a molecular weight of from 300 to 3,000, a chlorine content and/or bromine content of from 40 to 80% by weight and an OH number of from 20 to 200 and process of producing the same.

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3,745,193

## PROCESS FOR PRODUCING A PHENOL BY OXIDATION OF AN AROMATIC HYDROCARBON

**Herbert Riegel, Palisades, N.J., Harvey D. Schindler, New York, N.Y., and Morgan C. Sze, Upper Montclair, N.J., assignors to The Lummus Company, Bloomfield, N.J.**

**Filed Oct. 23, 1968, Ser. No. 769,813**

**Int. Cl. C07c *37/00***

**U.S. Cl. 260—621 G** **5 Claims**

Process for producing an alcohol from a feed containing an alkane, cycloalkane, aromatic hydrocarbon, or halo-substituted derivatives thereof wherein the feed is contacted with water, preferably as steam, and a melt containing a multivalent metal halide in both its higher and lower valence state, such as a mixture of cupric and cuprous chloride. In accordance with a preferred embodiment, the contacting is effected in the presence of an oxygen containing gas or the melt is previously contacted with an oxygen-containing gas to produce the corresponding oxyhalide of the metal, whereby the reaction may be effected on a continuous basis.

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3,745,194

## OXIDATIVE DEHYDROGENATION OF PARAFFINIC HYDROCARBONS

**Brent J. Bertus, Floyd Farha, Jr., and Harlin D. Johnston, Bartlesville, Okla., assignors to Phillips Petroleum Company**

**No Drawing. Filed Oct. 16, 1970, Ser. No. 81,599**

**Int. Cl. C07c *5/18***

**U.S. Cl. 260—680 E** **12 Claims**

Organic compounds are dehydrogenated to compounds having a higher degree of unsaturation by contacting the feedstock in the vapor phase in the presence of an oxygen-containing gas with a catalyst containing tin in an oxidized state in combination with at least one of the metals bismuth, cobalt, or nickel in an oxidized state. Representative of such conversions is the oxidative dehydrogenation of butane to 1,3-butadiene over a nickel stannate-containing catalyst. The conversion products are valuable compounds particularly useful as intermediates for the preparation of polymeric materials such as synthetic rubbers and the like.

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3,745,195

## PROCESS FOR EQUILIBRATING ALLENE AND METHYLACETYLENE AND FOR RECOVERY OF PURE ALLENE FROM THE EQUILIBRIUM MIXTURE

**Edward S. Rothman, North Hills, and Samuel Serota, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture**

**No Drawing. Filed Aug. 31, 1971, Ser. No. 176,735**

**Int. Cl. C07c *7/02***

**U.S. Cl. 260—681.5** **3 Claims**

Methylacetylene and allene are equilibrated by contact with potassium hydroxide in an inert solvent such as t-butanol. When mixtures of methylacetylene and allene are used in a chemical reaction such as the preparation of isopropenyl stearate from stearic acid and zinc stearate is the sole catalyst, methylacetylene is selectively absorbed by the stearic acid leaving behind highly purified allene. Alternatively, when potassium stearate is present with the zinc stearate and sufficient stearic acid is present, the allene-methylacetylene mixture is completely absorbed. The zinc stearate-potassium stearate co-function synergistically.

3,745,196
**LOW-TEMPERATURE AND OIL-RESISTANT CORE-SHELL ACRYLIC POLYMERS**

**Constance A. Lane, Philadelphia, and William H. Harrop, Uwchland, Pa., and Roger K. Graham, Cherry Hill, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**No Drawing. Continuation-in-part of application Ser. No. 827,945, May 26, 1969. This application Jan. 19, 1972, Ser. No. 219,167**

**Int. Cl. C08f** *15/40*

**U.S. Cl. 260—881** **26 Claims**

Acrylic elastomers, prepared by a poly-stage polymerization procedure in which a first-stage polymer is at least partially encapsulated with subsequent polymer, are provided. The first-stage polymer includes at least 50% by weight monomeric acrylate which when homopolymerized produces a polymer having a glass temperature below about —35° C., such as butyl acrylate, optionally with minor proportions of other alkyl acrylates and substituted alkyl acrylates such as alkoxy- and nitrile-substituted alkyl acrylates, and generally one or more curing-site monomers that contribute sites for vulcanization of the elastomer. For rapid cure, it is preferred to use a monomer with active chlorine as the cure-site. The final-stage polymer comprises at least 60% by weight ethyl acrylate and/or methyl acrylate, from 0 to 40% of an acrylic nitrile, and, preferably, a curing-site monomer. Optional intermedaite polymerization stages can be interposed between the first-stage polymerization and the final stage polymerization. The elastomers can be compounded and vulcanized to produce elastic polymers having rubbery physical characteristics having a balance of desirable properties which permits their use as automotive gaskets, transmission seals, and the like in demanding automotive environments. The elastomers are also useful in coating compositions such as for paper and in caulks.

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3,745,197
**BIS(2,3-DIHALOPROPYL) 2-CYANOALKYL-PHOSPHONATES**

**Arthur D. F. Toy, Stamford, Conn., and Kenneth I. Eilers, Irvington, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.**

**No Drawing. Filed Sept. 21, 1970, Ser. No. 74,139**

**Int. Cl. C07f** *9/40*

**U.S. Cl. 260—940** **5 Claims**

The new compounds bis(2,3-dihalopropyl) 2-cyanoalkylphosphonates are disclosed which have been found to be effective flame retardants for plastics such as polymethyl methacrylate, cellulose acetate, and viscose rayon.

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3,745,198
**O-HALOVINYL PHOSPHOROTHIONATES**

**Samuel B. Soloway and Juan G. Morales, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed Oct. 9, 1970, Ser. No. 79,699**

**Int. Cl. C07f** *9/08;* **A01n** *9/36*

**U.S. Cl. 260—957** **9 Claims**

Certain beta-halovinyl esters of phosphorothionic acids are useful as insecticides and as anthelmintics.

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3,745,199
**METHOD OF MAKING AN IMPROVED CASE-BONDED END-BURNING PROPELLANT GRAIN WITH RESTRICTED STRESS-RELIEF PORTS**

**Stanley E. Anderson, Huntsville, Bernard L. Thompson, Toney, and Charles E. Thies and Thomas L. Cost, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army**

**Filed Dec. 23, 1968, Ser. No. 786,492**

**Int. Cl. C06b** *21/02*

**U.S. Cl. 264—3 R** **3 Claims**

A method of making an improved case-bonded end-burning propellant grain with restricted stress-relief ports. The grain is divided into at least three segments by an internal perforation having the same number of radial arms, preferably equally spaced, with stress-relieving fillets or ports at each junction of the grain with the motor case. The method involves applying a restrictor over a release agent also applied to a mandrel (which mandrel later forms the perforation) and bonding the restrictor to the propellant during the casting and curing operation. The mandrel is then removed.

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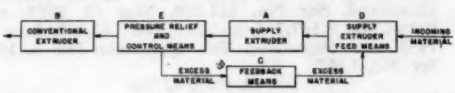
3,745,200
**EXTRUSION METHOD**

**Paul Geyer, 15660 Tacoma Ave., Detroit, Mich. 48205**

**Original application Jan. 10, 1969, Ser. No. 790,406, now Patent No. 3,632,255. Divided and this application Feb. 18, 1971, Ser. No. 116,501**

**Int. Cl. B29h** *19/00;* **B28b** *3/22*

**U.S. Cl. 264—37** **2 Claims**




Method and apparatus for the extrusion of thermoplastic materials. First and second worm-type extruders are provided, the first being designed to produce a uniformly extrudable material and having a capacity in excess of that of the second. The uniformly extrudable material discharged from the first extruder enters pressure relief and control means from which it is fed into the second extruder, to the extent of its lesser capacity, at a constant pressure. Excess material discharged from the first extruder passes through an orifice and is returned by feedback means to a preferred position in the feed means for the first extruder. The material fed into the second extruder is discharged therefrom at a uniform volumetric extrusion rate, thereby providing a metering effect, and without significant physical or dimensional variations in the extrudate.

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3,745,201
**METHOD OF MANUFACTURING CERAMIC FOAM BODIES**

**Erich Sundermann and Johanna Viedt, Broitzem, Germany, assignors to Zytan Thermochemische Verfahrenstechnik G.m.b.H. & Co. Kommanditgesellschaft, Braunschweig, Germany**

**Filed Mar. 19, 1970, Ser. No. 20,916**

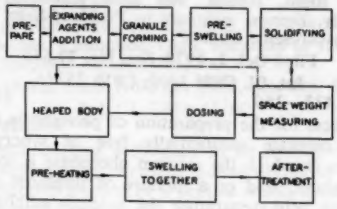
**Claims priority, application Germany, Mar. 21, 1969, P 19 14 372.7; Sept. 10, 1969, P 19 45 811.8, P 19 45 810.7**

**Int. Cl. B28b** *1/50*

**U.S. Cl. 264—43** **6 Claims**

A method of and an apparatus for manufacturing of bodies of swelling clay or equivalent material, which comprise the steps of heating substantially ball-shaped granules formed of treated clay capable of swelling to a plastically binding capacity of their surfaces, then swelling the granules, and deforming the granules to at least partly filling of the gap volume between the granules. Then the granules are bound together by mutual engagement of the surfaces of plastically binding capacity to an integral body. A predetermined quantity of granules of about unitary size are disposed in a heaped body nonyieldingly supported on all sides. Highly heated gas blows

alternately controlled from opposite sides for short time periods up to an equal plastically binding capacity of the




surfaces of all the granules, and the granules are united due to swelling with simultaneous filling of the gap spaces.

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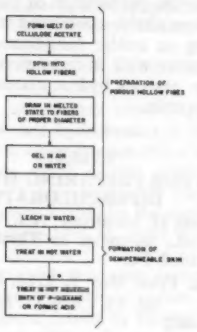
**3,745,202**

## METHOD OF PREPARING AN ASYMMETRIC MEMBRANE FROM A CELLULOSE DERIVATIVE

**Billy M. Riggleman and Mark E. Cohen, Cumberland, and Michael A. Grable, Frostburg, Md., assignors to the United States of America as represented by the Secretary of the Interior**

**Filed Mar. 17, 1971, Ser. No. 125,240**
**Int. Cl. B29d** *27/00;* **C08b** *29/10, 29/32*
**U.S. Cl. 264—41** **10 Claims**


FORM MELT OF CELLULOSE ACETATE
SPIN INTO HOLLOW FIBERS
DRAW IN MELTED STATE TO FIBERS OF PROPER DIAMETER
GEL IN AIR OR WATER
PREPARATION OF POROUS HOLLOW FIBERS
LEACH IN WATER
TREAT IN HOT WATER
TREAT IN HOT AQUEOUS BATH OF P-DIOXANE OR FORMIC ACID
FORMATION OF SEMIPERMEABLE SKIN

Asymmetric membranes are prepared from non-selective thermally gelled substrates of a cellulose derivative. After leaching, the substrate is annealed and then treated in a dilute aqueous solution of either p-dioxane, formic acid or nitromethane at an elevated temperature. The resulting semipermeable membrane is particularly suited for desalination by reverse osmosis.

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**3,745,203**

## PROCESS FOR MOLDING POLYURETHANE UTILIZING A MIXTURE OF TWO BLOWING AGENTS

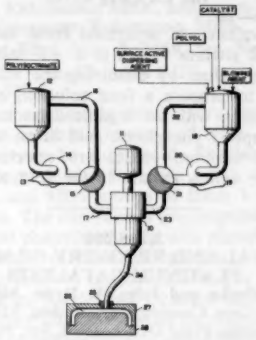
**Robert C. Harper, Loveland, Ohio, assignor to The Cincinnati Milling Machine Co., Cincinnati, Ohio**

**Continuation of abandoned application Ser. No. 881,823, Dec. 3, 1969. This application Aug. 19, 1971, Ser. No. 173,301**
**Int. Cl. B29d** *27/00;* **C08g** *22/44, 53/10*
**U.S. Cl. 264—48** **6 Claims**

A process for the production of uniform polyurethane moldings substantially free of surface voids, by

(1) mixing a polyisocyanate, a polyol, and a blowing agent;
(2) passing the resultant liquid nonexpanded mixture into a closed mold;
(3) allowing the liquid to expand and fill the mold as the polyurethane is formed; and
(4) curing and removing the resultant molded article;

employing as a blowing agent a mixture of two volatile blowing agents, i.e., dichlorodifluoromethane and trichloromonofluoromethane, which mixture when incorporated into the nonexpanded liquid molding mixture exhibits a vapor pressure of not more than one atmosphere at 110° F. The process is useful for production of molded articles for structural purposes, furniture, etc.

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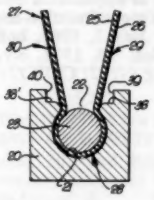
**3,745,204**

## PROCESS FOR MAKING IMPROVED SEALS

**Louis E. Telbizoff, Rolling Hills, Calif., assignor to SFS Industries, Los Angeles, Calif.**

**Continuation-in-part of abandoned application Ser. No. 840,406, July 9, 1969. This application Sept. 7, 1971, Ser. No. 178,249**
**Int. Cl. B29g** *5/00;* **B29h** *9/02*
**U.S. Cl. 264—257** **15 Claims**



A mold assembly, as much as 12 feet long, consists of a strip of material having a cavity extending from end to end, the cavity being smooth walled about its periphery and open at ends and on one side. Curable sheet composite elastomer material faced with a reinforcing sheet is folded around a mandrel leaving free flaps and slid endwise into the cavity. The flaps are then folded on each other over a filler and a cover strip forming a part of the mold is laid over them. This assembly is then loaded endwise into a container of similar length in which is an inflatable bag, the container being located in an oven. The bag is first inflated to press the cover strip against the exterior of the mold assembly and heat is applied to cure the elastomer material. Thereafter the bag is deflated, the mold assembly removed from the container, the elastomer material and mandrel removed endwise from the mold cavity and the mandrel removed from the cured elastomer material to free the cured finished product.

## 3,745,205
## EXTRACTION OF URANIUM FROM AN AQUEOUS SOLUTION

Donald F. Peppard, Oak Park, and George W. Mason, Clarendon Hills, Ill., Allen F. Bollmeier, Jr., Terre Haute, Ind., and Sonia Lewey, Joliet, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Feb. 17, 1972, Ser. No. 227,114
Int. Cl. C01g *43/02*
U.S. Cl. 423—10 6 Claims

Uranium values are separated from the lanthanides, actinides, and yttrium values in a +3 valence state and from thorium values by dissolving the values in hydrochloric acid to prepare a feed solution, and contacting the feed solution with an organic extractant of bis(2,6-dimethyl-4-heptyl) phosphoric acid in an organic diluent whereby the uranium values are selectively extracted and the other values remain in the feed solution.

## 3,745,206
## REMOVAL AND RECOVERY OF SOLUBLE PLATINUM CATALYSTS

Loren A. Haluska and John W. Ryan, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

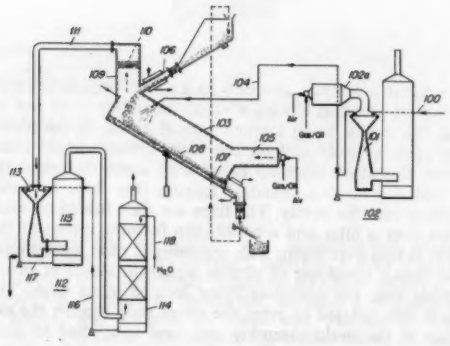
No Drawing. Filed Oct. 1, 1970, Ser. No. 77,397
Int. Cl. C01g *55/00*
U.S. Cl. 423—22 8 Claims

Processes are disclosed for the removal and recovery of soluble platinum catalysts from liquids. The processes comprise the steps of (1) adding a solid carrier having a thiol or thioether functional silicone attached to its surface to the liquid from which the soluble platinum catalyst is to be removed, (2) heating the resulting mixtures with agitation, (3) separating the solid carrier and formerly soluble platinum catalyst from the liquid, and (4) recovering the soluble platinum catalyst from the solid carrier.

## 3,745,207
## PROCESS FOR THE RECOVERY OF WASTE PICKLE LIQUOR

Lars J. Hansen, Wilmington, Del., assignor to Environmental Technology, Inc.

Continuation-in-part of application Ser. No. 99,223, Dec. 17, 1970, which is a continuation-in-part of application Ser. No. 838,511, July 2, 1969, both now abandoned. This application Jan. 25, 1971, Ser. No. 109,144
Int. Cl. C01g *49/02*; C01b *17/48, 17/68*
U.S. Cl. 423—154 13 Claims




Waste acid pickle liquor is converted into iron oxide and acid by depositing it on a compact moving bed and sweeping the bed with hot oxidizing gases.

## 3,745,208
## WET PROCESS MANUFACTURE OF PHOSPHORIC ACID AND CALCIUM SULPHATE

Bernard Bigot, Rouen, and Jean Roubinet, Grand-Quevilly, France, assignors to Pechiney-Saint Gobain, Neuilly-sur-Seine, France

Filed Oct. 2, 1970, Ser. No. 77,616
Int. Cl. C01f *1/00*; C01b *25/16*
U.S. Cl. 423—166 14 Claims

A process for the preparation of phosphoric acid and calcium sulphate substantially free of syncrystallized phosphate in which the calcium phosphate is solubilized with sulphuric acid or a mixture of sulphuric acid and phosphoric acid, separating the calcium sulphate from the phosphoric acid and treating the calcium sulphate in the separation device with a treating solution in the form of an aqueous solution containing sulphuric acid for modification of the state of hydration, and then separating and washing the modified calcium sulphate.

## 3,745,209
## PROCESS FOR THE PREPARATION OF VANADIUM (CARBO) NITRIDE

Servaas Middelhoek, Arnhem, Netherlands, assignor to N.V. Hollandse Metallurgische Industrie Billiton, Arnhem, Netherlands

No Drawing. Filed Sept. 9, 1970, Ser. No. 70,888
Int. Cl. C01b *21/10*
U.S. Cl. 423—371 7 Claims

A process for the preparation of vanadium carbonitride and/or vanadium nitride-containing materials, which consists in treating an oxidic vanadium-containing material at high temperature with, in succession, or wholly or partly simultaneously, gaseous hydrocarbons and nitrogen, with or without ammonia.

## 3,745,210
## PROCESS FOR PREPARING HYDRAZINIUM DIPERCHLORATE

Archie R. Young II, Montclair, N.J., and Herschel Hunt, Lafayette, Ind., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed May 9, 1963, Ser. No. 279,334
Int. Cl. C01b *11/18*
U.S. Cl. 423—462 12 Claims

1. A process for preparing anhydrous hydrazinium diperchlorate substantially free from contaminants comprising the steps of contacting a hydrazinium dihalide with a perchlorate salt selected from the group consisting of sodium, potassium, rubidium, cesium, and ammonium perchlorates, in the presence of a stoichiometric excess of anhydrous hydrogen fluoride reaction liquor under substantially anhydrous conditions until insoluble hydrazinium diperchlorate product precipitates out and separating the precipitated product contained therein from the reaction liquor.

## 3,745,211
## METHOD FOR DETERMINING THYROXINE IN BLOOD SERUM AND REAGENT THEREFOR

James L. Brown and Floyd P. Hallett, St. Louis County, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed Apr. 8, 1971, Ser. No. 132,333
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 9 Claims

A buffered reagent comprising radioactive thyroxine and a chelating agent. The use of such a solution containing thyroxine-binding globulin in the radiometric serum thyroxine assay method of James L. Brown (application Ser. No. 865,785, filed Oct. 13, 1969) improves the reliability of the results obtained therefrom.

3,745,212

## METHOD FOR EVALUATING PANCREATIC ENZYME SUFFICIENCY AND COMPOUNDS USEFUL THEREIN

Peter L. de Benneville, Philadelphia, Pa., and Norton J. Greenberger, Columbus, Ohio, assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Nov. 19, 1970, Ser. No. 91,173

Int. Cl. G01n *31/00*

U.S. Cl. 424—9 14 Claims

Pancreatic enzyme sufficiency in an animal organism can be evaluated by internally administering to the animal an effective amount of a peptide which is susceptible to hydrolytic cleavage in the presence of a pancreatic endopeptidase and has the formula

Q—NHQ'CO—Q''

wherein

Q is an amine-blocking group,
NHQ'CO is an amino acid linkage, and
Q'' is an analyzable group, collecting the urine of the animal, and analyzing the urine to determine the quantity of the hydrolyzed analyzable group in the urine.

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3,745,213

## VAPOR DIFFUSING COMPOSITION AND METHOD OF MAKING THE SAME

Leonard N. Nysted, 617 Rice, Highland Park, Ill. 60035

No Drawing. Continuation-in-part of application Ser. No. 686,769, Nov. 29, 1967. This application July 7, 1969, Ser. No. 839,619

Int. Cl. A01n *17/00;* A61k *27/00;* C11b *9/00*

U.S. Cl. 424—19 17 Claims

A vapor diffusing composition consisting essentially of a granulated metallic salt hydrate carrier for adsorbedly holding molecules of a vapor source and a binder holding the granules together, which binder consists essentially of paraffin and polyethylene wax, said binder also providing a molecular sieve to retain the molecules of the vapor allowing the molecules to leave at a prescribed rate. The method includes the steps of heating the paraffin, adding the polyethylene wax to melted paraffin, adding and mixing the granulated carriers, partial dehydration of the granulated carrier by heating, partial cooling of the mixture, and adding the vapor material. Upon further cooling, the mixture solidifies and can be fragmented for compression molding.

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3,745,214

## METHOD FOR THE TREATMENT OF ACUTE OR CHRONIC DIARRHEA

André Queuille, Noisy-le-Sec, and Raymond Larde, Coubron, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 116,675, Feb. 18, 1971, which is a continuation of application Ser. No. 663,979, Aug. 29, 1967, both now abandoned. This application Feb. 19, 1971, Ser. No. 117,066

Claims priority, application France, Aug. 31, 1966, 74,796

Int. Cl. A61k *27/00*

U.S. Cl. 424—78 6 Claims

The present invention relates to a pharmaceutical composition for the control of acute or chronic diarrhea which comprises a minor amount of a pulverulent, pharmaceutical-grade polyamide selected from the group consisting of nylon 6, nylon 66, nylon 610, nylon 11 and copolymers of nylon 66 and nylon 12 and a major amount of a pharmaceutical medium. The pharmaceutical composition is utilized for controlling diarrhea by orally administering the composition containing a therapeutically effective amount of the active principle to a subject suffering from diarrhea.

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3,745,215

## METHODS OF COMBATTING INSECTS AND MITES USING ALKANOYL CHLORIDE PHENYLHYDRAZONES

Girts Kaugars, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,976

Int. Cl. A01n *9/20*

U.S. Cl. 424—327 6 Claims

Certain alkanoyl chloride phenylhydrazones have been found to be active against insects and mites. The phenylhydrazone ring can be substituted. Suitable substituent groups are halogen atoms, the nitro group, the trifluoromethyl group, and alkyl groups of from 1 to 6 carbon atoms, inclusive. The compounds are prepared by reacting an alkanoic acid phenylhydrazide with phosphorus pentachloride to obtain an alkanoyl chloride (dichlorophosphinyl)phenylhydrazone intermediate that is reacted with phenol to produce the desired alkanoyl chloride phenylhydrazone. Certain compounds can be prepared by direct chlorination of an alkanaldehyde phenylhydrazone. Some of the compounds are novel. Methods of use and compositions are described.

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3,745,216

## COMPOSITIONS AND METHODS FOR PRODUCING HYPOTENSIVE ACTIVITY WITH IMIDAZO AND PYRIMIDO[2,1-b]QUINAZOLINE COMPOUNDS

Timothy Yu-Wen Jen and Bernard Loev, Broomall, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 886,370, Dec. 18, 1969, now Patent No. 3,621,025. This application Mar. 1, 1971, Ser. No. 120,064

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 14 Claims

Compositions having hypotensive activity containing imidazo and pyrimido[2,1-b]quinazoline compounds and methods of producing hypotensive activity by administering these compounds.

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3,745,217

## THIAZOLOPYRIMIDINES FOR REVIVING AN OVERDOSE OF BARBITURATE

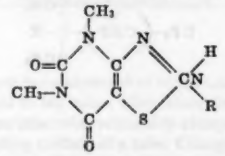
Arthur Berger, Skokie, Ill., and Edeltraut E. Borgaes, Sindelfingen, Germany, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Original application Aug. 13, 1969, Ser. No. 849,899, now Patent No. 3,660,405. Divided and this application Nov. 18, 1971, Ser. No. 200,209

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 1 Claim

Thiazolopyrimidines having the general formula



wherein R is selected from the group consisting of lower alkyl having from 1 to about 4 carbon atoms and allyl, for example, 4,6-dimethyl-2-n-propylaminothiazolo-[4,5-d]-pyrimidine-5,7-dione, are pharmaceutically administered to animals given an overdose of barbiturate for reviving said animals.

3,745,218

## PRESERVATION PROCESS USING 2-(4-HYDROXYPHENYL)-BENZOFURAN

Leonard Jurd, Berkeley, and Alfred Douglas King, Jr., Martinez, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Feb. 27, 1970, Ser. No. 15,302. Divided and this application Mar. 26, 1971, Ser. No. 128,580

Int. Cl. A61k *27/00*; A61l *13/00, 23/00*
U.S. Cl. 424—285 1 Claim

Process for preserving a substance normally subject to spoilage by yeasts or bacteria which comprises incorporating with the substance an amount of 2-(4-hydroxyphenyl) - benzofuran which is sufficient to inhibit the the growth of yeasts and bacteria.

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3,745,219

## COMPOSITION AND METHOD FOR CONTROLLING BACTERIA WITH ORGANOTIN COMPOUNDS

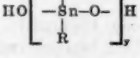
Gerald A. Baum, Paramus, and William J. Considine, Somerset, N.J., assignors to M & T Chemicals Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 278,784, May 7, 1963, now Patent No. 3,328,239. This application June 12, 1967, Ser. No. 645,505

The portion of the term of the patent subsequent to June 27, 1984, has been disclaimed

Int. Cl. A01n *9/00*
U.S. Cl. 424—288 4 Claims

In accordance with certain of its aspects, this invention relates to a method for controlling the growth of bacteria which comprises treating said bacteria with an aqueous solution of a material selected from the group consisting of



and alkali metal salts thereof; wherein R is selected from the group consisting of tert-butyl, tert-amyl and neopentyl; and *y* is 1–2.

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3,745,220

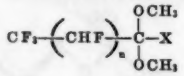
## ANESTHETIZING COMPOSITION AND METHOD

Ross C. Terrell, Plainfield, and George L. Moore, South Plainfield, N.J., assignors to Airco, Inc., New York, N.Y.

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,379

Int. Cl. A61k *27/00*
U.S. Cl. 424—341 2 Claims

Aliphatic ether compounds of the formula



wherein *n* is zero or one, and —X is —$CF_3$ or —H when *n* is zero and is —$OCH_3$ when *n* is one, are useful as inhalation anesthetics.

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3,745,221

## METHODS AND COMPOSITIONS FOR IMPROVING FEED EFFICIENCY OF RUMINANTS USING POLYHYDRIC ALKANOL HALOACETALDEHYDE HEMIACETALS

Roger C. Parish, King of Prussia, and John E. Trie, Malvern, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of applications Ser. No. 881,868 and Ser. No. 881,915, both Dec. 3, 1969. This application Oct. 5, 1970, Ser. No. 78,188

Int. Cl. A61k *27/00*; A23k *1/18*
U.S. Cl. 424—342 16 Claims

Polyhydric alkanol haloacetaldehyde hemiacetals are potent inhibitors of methanogenesis in the ruminant animal. Consequently these chemical agents improve the feed efficiency in ruminants at levels which do not have therapeutic or general antifermentation effects in the animal. The most useful and representative compound is pentaerythritol tetrachloral hemiacetal. Methods of administration, feed compositions and premixes containing said inhibitors are described.

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3,745,222

## CINNAMYL PHENOLS USEFUL AS ANTIMICROBIAL AGENTS

Leonard Jurd, Berkeley, Alfred Douglas King, Jr., Martinez, and William L. Stanley, Richmond, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Sept. 22, 1970, Ser. No. 74,485

Int. Cl. A01n *9/00, 9/26*
U.S. Cl. 424—346 7 Claims

Substances which are subject to microbial spoilage are preserved by addition of cinnamyl phenols, e.g., 2-cinnamylphenol, 4-cinnamyl-phenol, 2-cinnamyl-4-methylphenol, etc.

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3,745,223

## ANTI-INFLAMMATORY AGENTS

Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 91,559, Nov. 20, 1970, which is a continuation-in-part of application Ser. No. 888,802, Dec. 29, 1969, both now abandoned. This application Mar. 29, 1971, Ser. No. 129,237

Int. Cl. A61k *27/00*
U.S. Cl. 424—353 25 Claims

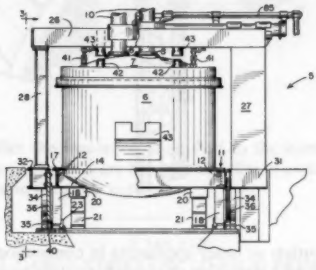
Methods of treating various conditions involving inflammation and its concomitant swelling, tenderness, decreased mobility, pain, and fever, employing an aralkyl hydrocarbon as the active anti-inflammatory agent.

# ELECTRICAL

## 3,745,224
## ELECTRIC FURNACE INSTALLATION

**Victor H. Ames, Midlothian, Ill., assignor to Whiting Corporation, Harvey, Ill.**

**Filed Oct. 20, 1971, Ser. No. 190,950**
**Int. Cl. F27d** *3/00*; **F27b** *14/02*
**U.S. Cl. 13—10** **25 Claims**



The roof of a top-charge direct arc melting furnace is supported from the superstructure of a gantry frame structure and, if desired, with the furnace back plate assembly serving as the pillar or upright frame member on one side of the furnace body. This gantry or bridge-like structure is supported on a support platform extending alongside the furnace body, and, in certain embodiments, fore-and-aft platform members on opposite sides of the furnace body are interconnected at their front ends by a cross member into a U-shaped platform. The support platform and gantry structure constitute an assembly which is tiltable independently of the furnace body when the roof of the furnace is lifted, so as to uncover the furnace, thereby permitting it to be charged from the top. Means are provided so as to detachably interlock the support platform of the roof supporting gantry-platform assembly with the furnace body so that with the roof closed the furnace body together with the roof tilt in unison, either rearwardly for slag removal or forwardly for pouring. As a safety feature, the interlock means also serves to lock the furnace body or shell to a fixed part of the furnace pit until such time as the furnace shell or body is fully interlocked with the gantry support platform.

By reason of the foregoing construction a number of important advantages are provided in an electric furnace installation, one of them being that the center of gravity of the furnace body may be located so that it always tends to assume an upright position and not fall or tip over even when the roof is raised and moved from over the top of the furnace body. Elimination of severe cantilever loading to support the weight of the furnace roof may be accomplished in the new construction and a number of important advantages flow from this feature.

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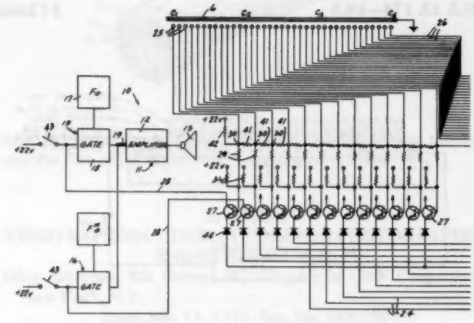
## 3,745,225
## MUSICAL INSTRUMENT HAVING AUTOMATIC FILL-IN MEANS

**George Robert Hall, 13613 Huston St., Sherman Oaks, Calif.**

**Filed Apr. 27, 1972, Ser. No. 248,015**
**Int. Cl. G10h** *1/00*
**U.S. Cl. 84—1.03** **14 Claims**



A musical instrument, such as an organ, includes conventional circuitry, and in addition a series of key-operated switches associated with one manual and respectively connected to a series of electronic switches that are normally nonconductive, each key-operated switch and each electronic switch being connected in series between a source of dc-keying potential and a corresponding tone signal source, and a second series of key-operated switches under the control of another manual, each such switch being resistively connected to control the electronic switch of a noncorresponding key along with musically adjacent noncorresponding keys. By this arrangement, in response to playing a chord on the first mentioned manual and a single note on the other manual, harmony is automatically added.

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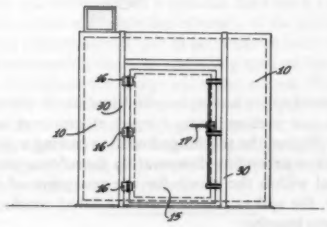
## 3,745,226
## SHIELDED ENCLOSURE

**Frederick J. Nichols, Los Angeles; Carl T. Luce, Woodland Hills, and James C. Senn, Westlake Village, all of Calif., assignors to Lectro Magnetics, Inc., Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 782,915, Dec. 11, 1968, abandoned. This application Apr. 5, 1971, Ser. No. 131,271**
**Int. Cl. H05k** *9/00*
**U.S. Cl. 174—35 MS** **3 Claims**

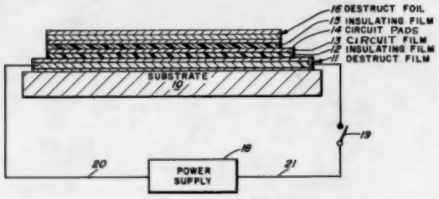


A shielded room is constructed of frame tubes and shielding panels are welded to the tubes when extending into a corner, but the panels are otherwise releasably clamped in pairs to an outwardly extending surface of a tube. Clamp panels and tube provide smooth magnetic transition between the panels clamped to the same tube. Tubes are releasably joined where the joint can be covered by integral paneling extending over the joint. A special door frame panel coacts with a door to provide broad contact and waveguide sealing when closed.

## 3,745,227
## SANDWICHED EUTECTIC REACTION ANTICOMPROMISE CIRCUITS

Leon Chernick, Los Angeles; Kikuo Ichiroku, Santa Monica, and Gary S. Smolker, Los Angeles, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 10, 1970, Ser. No. 97,453
Int. Cl. H05k 1/02
U.S. Cl. 174—68.5 5 Claims

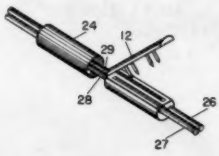



An anticompromise circuit having a thin film circuit sandwiched in between two eutectic reaction films separated by electrical insulating films, the eutectic reaction films consisting of a mixture of palladium and aluminum and adapted to be coupled to a switched electrical source to produce a eutectic reaction to destroy the thin film circuit.

## 3,745,228
## ELECTRICAL SPLICE

Kenuo J. Vogt, 5854 Kantor Court, San Diego, Calif.

Filed May 6, 1971, Ser. No. 140,809
Int. Cl. H01r 5/00
U.S. Cl. 174—88 2 Claims




An electrical splice having a cylindrical block which is truncated with one section being hinged at one end to form a complete cylinder, the top hinged section having a plurality of shorting spikes extending downwardly therefrom into at least one channel within the block for the reception of insulated conductors, the spikes piercing the insulated conductors and shorting them together.

## 3,745,229
## DUCT AND ELECTRICAL CONNECTOR ASSEMBLY

Maarten de Vos, Dubbeldam, Netherlands, assignor to Fokker-V.F.W. N.V., Schiphol-Oost, Netherlands

Filed Aug. 16, 1971, Ser. No. 172,111
Claims priority, application Netherlands, Aug. 19, 1970, 7012238
Int. Cl. H02g 3/04
U.S. Cl. 174—101 9 Claims

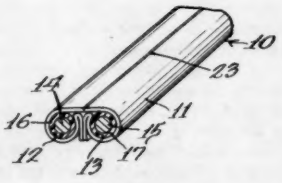
Cable duct for separate cables of different voltage, especially mains cables and telecommunication e.g. telephone, radio and television cables to be taken up in separate longitudinal duct channels and to be connected to terminals of

switches, outlets or other appliances in connection chambers of the duct, with transition channels for cables bypassing connection chambers.

## 3,745,230
## METAL SHEATHED ELECTRICAL WIRE CABLE

William D. Kelly, 12 Blodgett St., Clarendon Hills, Ill.

Continuation-in-part of Ser. No. 41,007, May 27, 1970, abandoned. This application Jan. 12, 1972, Ser. No. 217,195
Int. Cl. H01b 7/18
U.S. Cl. 174—103 21 Claims




A metal sheathed electrical wire cable having a sheath formed of a metal strip. The strip is formed to define a space in which a pair of wires are positioned. The opposite edtes of the strip are joined together and urged downwardly to between the wires to define a substantially fully enclosed raceway for each of the respective wires. The edge portions may comprise flanges facially welded together at a point remote from the wires so as to avoid heat damage to the wire insulation. The sheath may be provided with a longitudinal notch to define a means for facilitating tearing of the sheath to expose desired wire portions.

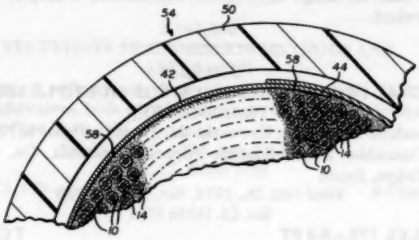
## 3,745,231
## FILLED TELEPHONE CABLES WITH IRRADIATED POLYETHYLENE INSULATION

George S. Eager, Jr., Upper Montclair, and Ludwik Jachimowicz, Elizabeth, both of N.J., assignors to General Cable Corporation, New York, N.Y.

Filed June 15, 1971, Ser. No. 153,231
Int. Cl. H01b 7/18
U.S. Cl. 174—107 8 Claims

This filled communication cable has polyethylene insulation on the conductors irradiated to avoid degrading of the polyethylene by contact with the filler material which is a

grease. Ordinarily the filler material contains petrolatum as its major ingredient. The irradiation of the insulation is performed after the insulation is applied to the conductors and before the conductors are brought together in contact with the petrolatum in the cable core.

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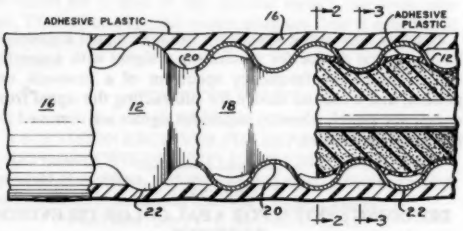
### 3,745,232
### COAXIAL CABLE RESISTANT TO HIGH-PRESSURE GAS FLOW

**Ernest H. Johnson, Chicago, and Conrad J. Ricker, Orland Park, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.**

**Filed June 22, 1972, Ser. No. 265,271**
**Int. Cl. H01b *11/18***
**U.S. Cl. 174—107** **6 Claims**




An annularly corrugated outer conductor is adhesively bonded to the foam dielectric of a coaxial cable at the corrugation roots and adhesively bonded to its tubular plastic sheath at the corrugation crests. Longitudinal passage or migration of fluid is blocked both along the inside and along the outside of the outer conductor without impairment of electrical or mechanical characteristics or complication of attachment of connectors.

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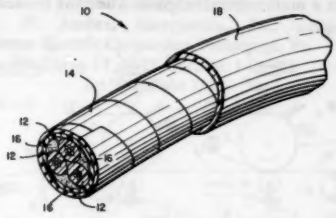
### 3,745,233
### FIRE RETARDANT CABLE

**Anthony R. Lania, Watertown; Edward L. Chase, Brockton; Francis M. Chase, Cohasset; Leonard P. Graham, Canton, and James E. Murray, Norwood, all of Mass., assignors to Chase Corporation, Randolph, Mass.**

**Filed July 24, 1972, Ser. No. 274,496**
**Int. Cl. H01b *7/02***
**U.S. Cl. 174—113 R** **2 Claims**

A fire-retardant insulating tape wrap having high tensile strength particularly for use in a service entrance cable includes a glass scrim backing to which a continuous polyester film is adhered using a synthetic rubber laminate adhesive which is applied to the film. After the tape is wrapped about the conductors, a continuous polyester sheath is extruded in situ over the wrapped conductors to provide a continuous outer jacket for the cable. The tape is made by coating the adhesive onto the film under relatively low application pressure. Then the film and scrim are brought together in a drying oven with the scrim being under relatively high lengthwise tension and the film being under lesser lengthwise tension.

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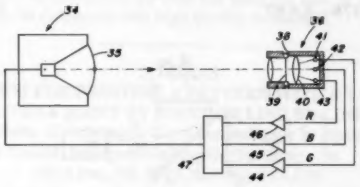
### 3,745,234
### VIDEO REPRODUCTION SYSTEM FOR PHOTOGRAPHIC AND OTHER IMAGES

**Oleg Szymber, Elk Grove, Ill., assignor to GAF Corportion, New York, N.Y.**

**Filed July 13, 1971, Ser. No. 162,150**
**Int. Cl. H04n *9/02***
**U.S. Cl. 178—5.2 R** **15 Claims**




An improved system for reproducing transparent photographic and other film images and opaque images on a television screen is provided in which the television picture tube upon which the image is displayed is utilized as a flying spot scanner for the image. The scanning spot from the tube is focused upon the image by a suitable lens. Light-sensitive means is positioned to receive such scanning light from the television tube which passes through or is reflected from the image and is responsive to the intensity of such light, which varies with the optical density or reflectance of the image, to produce electrical signals related thereto. These signals are amplified and returned via a suitable feed back circuit to the television unit to modulate the intensity of the screen illumination at any instantaneous spot in accordance with the signal intensity representing the corresponding spot on the image, and thereby reproduce the image upon the screen. This invention is adaptable to transparent and opaque image reproduction, still and motion picture reproduction, black-and-white and color reproduction and positive to positive and negative to positive reproduction, and may be readily employed in a home television entertainment system.

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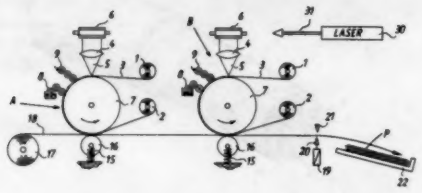
### 3,745,235
### METHOD AND APPARATUS FOR THE PRODUCTION OF COLOR PRINTS ON PAPER

**Fritz Bestenreiner, Grunwald; Josef Helmberger, and Richard Wick, both of Munich, all of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany**

**Filed May 25, 1971, Ser. No. 174,871**
**Claims priority, application Germany, Aug. 31, 1970, P 20 43 140.7**
**Int. Cl. H04n *9/02***
**U.S. Cl. 178—5.2 R** **11 Claims**

Color prints of multicolored originals are obtained on absorbent paper by exposing recording layers to the action of

electrooptically intensity-regulated laser beams so that the laser beams influence the affinity of recording layers to liquids and pigments in dependency on the distribution of different colors in a multicolored original. The thus treated recording




layers are thereupon wetted and pigmented in the respective colors prior to being brought into contact with a strip of paper to form thereon a series of overlapping images of the original, each such image being of a different color.

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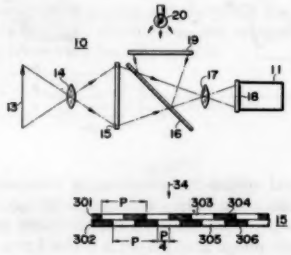
**3,745,236**

## COLOR TELEVISION CAMERA EQUIPMENT

**Yoshiteru Karato, Tokyo, Japan, assignor to Shiba Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 6, 1970, Ser. No. 87,382**
**Claims priority, application Japan, Nov. 10, 1969, 44/89335**
**Int. Cl. H04n 9/06**
**U.S. Cl. 178—5.4 ST** **5 Claims**



A striped color filter device is provided which comprises at least two striped color filter elements. The color filter elements are capable of preventing the transmission therethrough of at least one color and disposed out of phase with each other by one-fourth pitch. Also there is provided a striped filter for generating a reference frequency. A plurality of electrical signals may be derived from one image tube.

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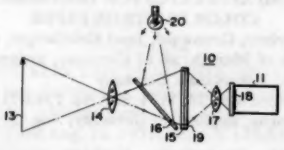
**3,745,237**

## COLOR TELEVISION CAMERA EQUIPMENT HAVING A REFERENCE FILTER AND A COLOR FILTER ASSEMBLY INTERPOSED BETWEEN THE CAMERA AND SUBJECT

**Yoshiteru Karato, Tokyo, Japan, assignor to Shiba Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 20, 1970, Ser. No. 91,470**
**Claims priority, application Japan, Nov. 22, 1969, 44/93339**
**Int. Cl. H04n 9/06**
**U.S. Cl. 178—5.4 ST** **9 Claims**



A striped color filter assembly comprising at least two different color filter stripes at least one of which may prevent the transmission of at least one colored light and which are arrayed so as to be out of phase with each other by ¼ pitch is used in combination with a striped filter for generating a reference frequency. Both of the striped filters are interposed between an image tube of the camera and a subject to be televised.

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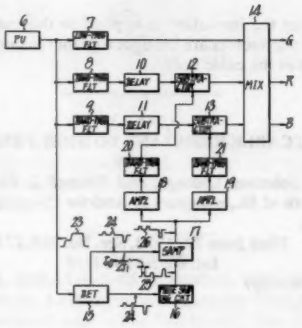
**3,745,238**

## SIGNAL PROCESSING SYSTEM FOR MULTIPLE SIGNAL TRANSMISSION

**Masahide Yoneyama, Kawasaki-shi, Japan, assignor to Nippon Columbia Kabushikiaisha Nippon Columbia Co. Ltd., Tokyo, Japan**

**Filed Oct. 26, 1971, Ser. No. 192,088**
**Int. Cl. H04n 9/06**
**U.S. Cl. 178—5.4 ST** **7 Claims**




A signal processing system for multiple signal transmission having a first device for generating a signal with a spectrum equivalent to the frequency spectrum of a crosstalk component, and a second device for subtracting the signal from a composite signal, whereby supurious signals are removed from the composite signal.

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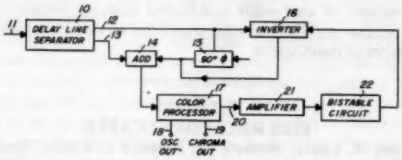
**3,745,239**

## DECODING SYSTEM FOR A PAL COLOR TELEVISION RECEIVER

**Donald E. Renaud, Stone Park, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 2, 1972, Ser. No. 231,304**
**Int. Cl. H04n 9/50**
**U.S. Cl. 178—5.4 P** **8 Claims**




A delay line type separator supplying first burst and chrominance signals to one input of a signal adding circuit and second burst and chrominance signals, through phase adjusting and gating circuits to a second input of the signal adding circuit. The phase adjusting and gating circuits include a phase splitter supplying an inverted and noninverted second chrominance signal through two diode gates and a 90° phase shifted second burst signal through a third diode gate. The output of the signal adding circuit, during burst transmission, is processed to produce a square pulse with a repetition rate equal to the sum of the first burst signal and the 90° phase

shifted second burst signal, or one half the repetition rate of the transmitted burst signals. The square pulse is utilized as a gating pulse to cause the diodes to supply alternately inverted second chrominance signals to the adding circuit.

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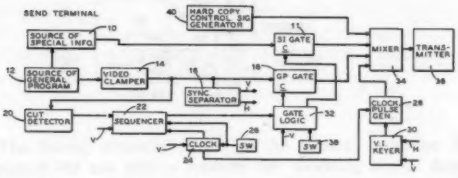
**3,745,240**

## TELEVISION TRANSMISSION METHODS AND APPARATUS

**Charles A. Morchand, New York, and Don J. Dudley, Brightwaters, both of N.Y., assignors to Data-Plex Systems, Inc., New York, N.Y.**

**Filed Oct. 29, 1970, Ser. No. 85,121**
**Int. Cl. H04n** *7/08*
**U.S. Cl. 178—5.6** **6 Claims**




A television system transmits a general viewer television program and special viewer program on a common channel. As the fields of the general viewer television program are fed to the transmitter they are monitored for a scene cut. When the scene cut is sensed a field of the special viewer program is substituted for a field of the general viewer television program. Thereafter a special viewer program field is substituted for each same given number of general viewer television program fields.

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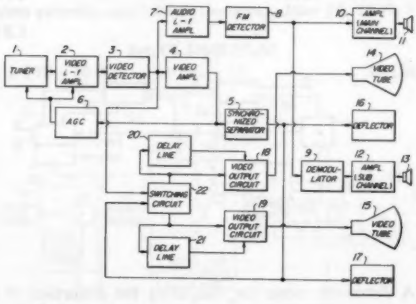
**3,745,241**

## TELEVISION RECEIVER FOR SEPARATING AND REPRODUCING MULTIPLEXED VIDEO SIGNALS

**Masayoshi Hirashima, Takatsuki-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Mar. 30, 1971, Ser. No. 129,345**
**Claims priority, application Japan, Apr. 8, 1970, 45/30266**
**Int. Cl. H04n** *7/08*
**U.S. Cl. 178—5.8 R** **7 Claims**




A television receiver in which a television signal containing two different kinds of video signals for every other scanning period is received, and the two different kinds of video signals are picked up separately from the received signal and displayed as different images on two different picture tubes.

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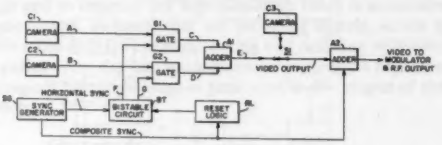
**3,745,242**

## MULTIPLEX TV SYSTEM FOR TRANSMITTING AND RECEIVING A PLURALITY OF PICTURES ON A LINE SHARING BASIS

**James W. H. Justice, Murrysville, Pa., assignor to Westinghouse Electric Corportion, Pittsburgh, Pa.**

**Filed May 17, 1971, Ser. No. 143,775**
**Int. Cl. H04n** *7/08*
**U.S. Cl. 178—6** **8 Claims**




System of transmitting and receiving a plurality of n-separate video pictures wherein every nth line of each of the pictures is selected for transmission beginning at a different line and wherein reception of a selected one of the pictures is accomplished by selecting from the plurality of lines transmitted every nth line commencing at the preselected line, with the selected line being delayed and then recombined with the underlayed selected line so that the selected one of the pictures may be displayed with high quality resolution.

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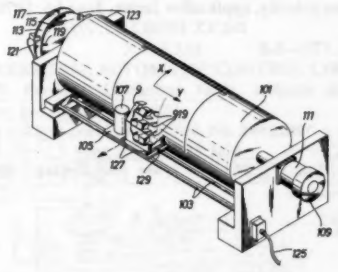
**3,745,243**

## SYSTEM FOR PRINTING A PATTERN WITH K LINES EITHER POINT BY POINT OR LINE BY LINE

**Helmut Seitz, Kaufbeuren, Germany, assignor to Firma Franz Morat GmbH, Stuttgart-Vaihingen, Germany**

**Filed Dec. 29, 1971, Ser. No. 213,504**
**Claims priority, application Germany, Dec. 30, 1970, P 20 64 388.3**
**Int. Cl. H04n** *1/06, 1/46*
**U.S. Cl. 178—6.6 R** **16 Claims**

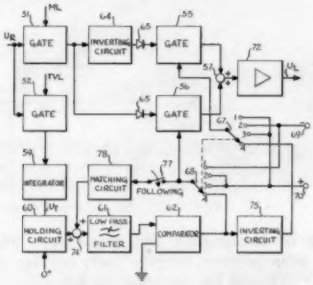



The system has, in combination, a support arrangement for supporting a drawing paper and a printing arrangement for printing a pattern on this drawing paper: There is a transport device for producing a relative movement in two directions between the support arrangement and the printing arrangement. Electrical signals are produced which give information about all characteristics of the pattern and these signals are fed to the printing arrangement to print out the pattern either point by point or line by line. The system further includes an arrangement for automatically printing out the first m points or the first part of each line of the pattern following the printing out of the relevant complete line. There is also an arrangement for automatically printing out the first n lines of the pattern following the printing out of all of the k lines of the pattern.

## 3,745,244
## AUTOMATIC CONTRAST SIGN SELECTOR FOR VIDEO TRACKING

Rune Jonsson, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Nov. 10, 1971, Ser. No. 197,464
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 7 Claims

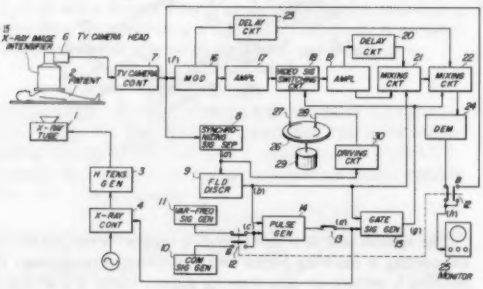



In automatic video tracking employing an electronic window, signals corresponding to a central area of the window that includes the target are analyzed for positive and negative contrast signal content. Only the signal component having the greater signal content is utilized in tracking. The signal analyzing apparatus comprises an integrator, a low pass filter and a comparator. It produces gate signals that pass the selected signal component to window position error circuits and block the other component.

## 3,745,245
## HIGH RESOLUTION SYSTEM FOR T.V. MONITORING OF INTERMITTANT X-RAY SIGNALS

Yasufumi Yunde, Iruma-gun, Saitama-ken; Shigenobu Yanaka, Koto-ku, Tokyo, and Kouichi Koike, Kashiwa-shi, all of Japan, assignors to Hitachi Roentgen Co., Ltd., Tokyo, Japan

Filed June 15, 1971, Ser. No. 153,333
Claims priority, application Japan, June 16, 1970, 45/52084
Int. Cl. H04n 5/32, 7/18
U.S. Cl. 178—6.8 10 Claims

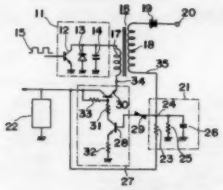



A high resolution system to supplement intermittent image fields in X-ray television monitoring for diagnosis, in which X-rays are radiated intermittently for every one or several frames of television signals, a field of video signals obtained in each X-ray radiation is recorded, and a signal thus recorded is repeatedly reproduced to obtain, through a delay circuit, two pieces of the video signal with a phase difference of one half of a horizontal scanning period, so that, by combining these two pieces of the video signal and displaying them as a frame of images, an image of high resolution can be observed even during the periods of interruption of X-ray radiation.

## 3,745,246
## HIGH VOLTAGE PRODUCING CIRCUIT FOR TELEVISION RECEIVERS

Shigeru Kashiwagi, Sarushimagun, Ibarogi Pref., Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ku, Yokohama, Japan

Filed Apr. 3, 1972, Ser. No. 240,727
Claims priority, application Japan, Apr. 3, 1971, 46/20528
Int. Cl. H04n 3/18
U.S. Cl. 178—7.5 R 6 Claims

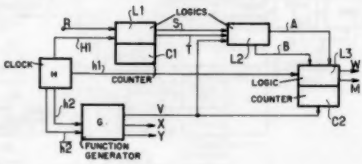


A high voltage producing circuit for television receivers wherein a voltage-dependent non-linear element is disposed between a circuit for detecting variations in the value of a picture tube current and a control circuit adapted to cause variations to occur in a direct current voltage supply from a direct current source to a flyback transformer upon receipt of output from the detection circuit so as to vary non-linearly the value of the direct current voltage supply to a circuit for supplying pulses to the flyback transformer with respect to a variation in the value of the picture tube current whereby the slope of the characteristics curve of the output of high voltage of the high voltage producing circuit with respect to the picture tube current can be reduced.

## 3,745,247
## DISTORTION METER PROVIDING POLYGON PATTERN INDICATION OF DISTORTION LEVEL

Pierre Estienne, Rosny-sous-Bois, France, assignor to Compagnie Industrielle des Telecommunications, Cit-Alcatel, Paris, France

Filed Sept. 30, 1971, Ser. No. 185,058
Claims priority, application France, Sept. 30, 1973, 7035404
Int. Cl. H04l 25/02
U.S. Cl. 178—69 A 11 Claims

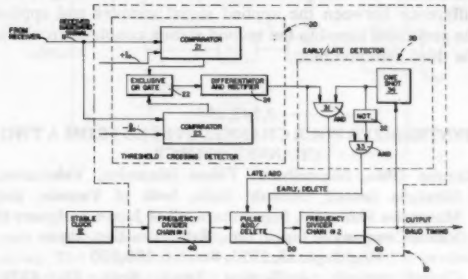



A distortion meter for indicating the distortion of a telegraphic signal includes a cathode ray tube, a deflection control arrangement for deflecting the electron beam to form the pattern of a closed polygon on the screen of the cathode ray tube, the length of the perimeter of the closed polygon corresponding to a prescribed degree of distortion and a beam control arrangement for controlling the electron beam to trace that portion of the polygon pattern corresponding to a measured degree of distortion.

## 3,745,248
## COARSE INITIAL TIMING RECOVERY CIRCUIT

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation, Anaheim, Calif.

Filed Nov. 16, 1970, Ser. No. 89,968
Int. Cl. H04l 7/00
U.S. Cl. 178—69.5 R 11 Claims

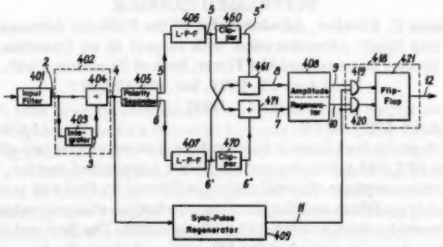



The timing recovery circuit of the present invention is designed for use with a receiver for receiving digital data signals transmitted at a baud rate at which these signals contain intersymbol interference components. The recovery circuit is comprised of a threshold crossing detector which provides an output signal each time the received signal passes through one of several preselected amplitude levels. An EARLY/LATE detector compares an output baud timing pulse train against the output signal from the threshold crossing detector and provides a first signal when the output signal is late and a second signal when the output signal is early. A pulse train generating means provides a train of pulses occuring at substantially an integer multiple of the baud timing rate to a pulse ADD/DELETE circuit. The ADD/DELETE circuit in response to the first or second signal adds or deletes a pulse from the provided pulse train to synchronize this pulse train to an integer multiple of the correct baud timing. A frequency divider chain following the ADD/DELETE circuit divides the pulse repetition rate down to the baud rate, maintaining the proper phase of the frequency divider output pulse train.

## 3,745,249
## REGENERATIVE TRANSMISSION SYSTEM FOR DIGITAL SIGNALS

Reinhold Weiss, Munchen, Germany, assignor to Krone GmbH, Berlin-Zehlendorf, Germany

Filed June 21, 1971, Ser. No. 155,351
Claims priority, application Germany, June 19, 1970, P 20 30 418.1
Int. Cl. H04l 25/20
U.S. Cl. 178—70 R 12 Claims

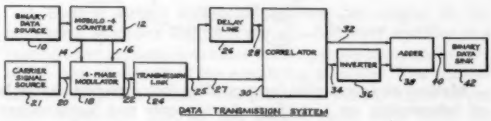



A repeater for binary signals, inserted in a transmission path, includes in its input circuit a narrow-band filter with a pass band whose midfrequency substantially equals half the basic pulse cadence 1/T whereby any change in signal voltage from "0" to "1" or vice versa gives rise to a sinusoidal half-cycle of one or the other polarity. The two polarities are separated to yield two unipolar pulse trains which are passed through respective low-pass filters cutting off above the aforementioned midfrequency whereby the pulses of each train are broadened to substantially double their original width and high-frequency noise is largely excluded. As the trough between two consecutive pulses of one train always coincides with a pulse of the other train, a cap clipped off the last-mentioned pulse may be added to the first train to deepen the trough and to improve the signal-to-noise ratio. A succession of sync pulses, derived from the incoming signals, serves to enable a flip-flop for alternate setting and resetting by respective pulses from the two unipolar trains whereby a replica of the original binary message is generated in the output of that flip-flop.

## 3,745,250
## METHOD AND APPARATUS FOR BINARY DATA

Carl W. Gerst, Winding Ways, R.D. No. 1, Skaneatles, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,489
Int. Cl. H04l 15/24
U.S. Cl. 178—88 1 Claim

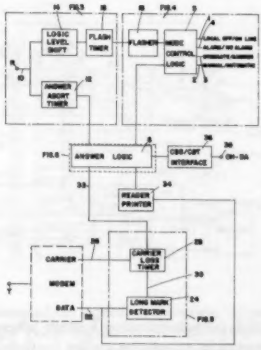



A method of binary data communication is performed by transmitting phase-modulated equal time interval bursts of a carrier signal wherein each of the different possible units of the binary data is represented by a different phase of the carrier signal. When the phase modulated carrier signal is received, units of binary data are generated in accordance with the phase differences in adjacent time intervals of the phase-modulated carrier signal. There is also disclosed various apparatus configurations for realizing the method.

## 3,745,251
## DATA TERMINAL AUTOMATIC CONTROL CIRCUIT

Richard D. Fretwell, Columbus, Ohio, assignor to Design Elements, Inc., Columbus, Ohio

Filed Jan. 3, 1972, Ser. No. 214,628
Int. Cl. H04m 11/06
U.S. Cl. 179—2 DP 4 Claims




A control circuit providing automatic data terminal answering in response to a ring signal request by a remote machine.

The circuit includes: logic circuitry for initiating operation of the terminal and placing the terminal off hook in response to a ring signal; circuitry for monitoring the transmission carrier and the data signal for switching the terminal on hook if the carrier or data transmission ceases for selected periods of time; and circuitry for returning the terminal on hook if a ring signal is not followed by data transmission within a suitable time period. Answer and originate modes are also selectable.

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**3,745,252**

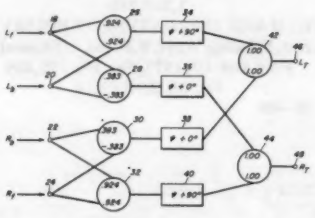
**MATRIXES AND DECODERS FOR QUADRUPHONIC RECORDS**

**Benjamin B. Bauer, Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.**

**Filed Feb. 3, 1971, Ser. No. 112,168**

**Int. Cl. H04r** *5/00*

**U.S. Cl. 179—1 GQ** **10 Claims**



Method and apparatus for recording four separate channels of information on a medium having only two independent tracks, such as a phonograph record, and method and apparatus for reproducing such information and presenting it on four loudspeakers to give the illusion of sound coming from four separate sources. The signals recorded in the manner described in this application are also reproducible on conventional stereophonic playback systems, distributing the four separate channels to the two loudspeakers in a manner to give a balanced and symmetrical reproduction. Two embodiments of encoding apparatus for combining the four input signals preparatory to recording on the two-track medium, and two decoders, one for each of the encoding systems, are described.

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**3,745,253**

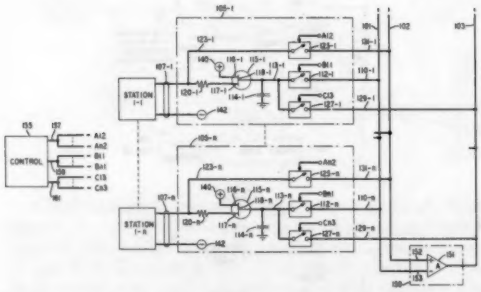
**TIME DIVISION SWITCHING SYSTEM**

**Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Feb. 9, 1972, Ser. No. 224,780**

**Int. Cl. H04j** *3/00*

**U.S. Cl. 179—15 AT** **11 Claims**



A time division communication system wherein a plurality of time slots occurs in repetitive cycles includes a plurality of stations each having a circuit for selectively coupling the associated station to first, second and third common buses, and a network for transferring signals from a first selected station to a second selected station in a distinct time slot. Each coupling circuit is operative to store signal samples from one of the first and third common buses, couple the stored signal to the associated line, and selectively connect the associated station to the second common bus during a distinct time slot. The signal transfer network receives a signal sample from a selected first coupling circuit store via the first bus and a sample of the signal appearing on the selected first station output via the second bus, generates a signal corresponding to the difference between the applied signal samples and applies the generated signal to the second station coupling circuit via the third common bus.

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**3,745,254**

**SYNTHESIZED FOUR CHANNEL STEREO FROM A TWO CHANNEL SOURCE**

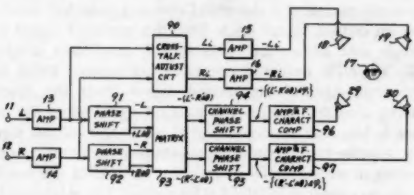
**Kazuho Ohta, Sagamihara; Takao Ninomiya, Yokohama; Hirotada Sasaki; Nobuaki Suda, both of Yamato, and Masanobu Shinozaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa-Ken, Japan**

**Filed Sept. 15, 1971, Ser. No. 180,620**

**Claims priority, application Japan, Sept. 15, 1970, 45/91423; Feb. 5, 1971, 46/4543; Feb. 6, 1971, 46/6027**

**Int. Cl. H04n** *5/00*

**U.S. Cl. 179—1 GQ** **8 Claims**



This invention relates to a synthesized four channel output from a two channel stereo source. The invention operates on left and right ((L), (R) input signals to produce difference signals (L—R), (R—L) by combining a left signal with a phase shifted right signal and by combining a right signal with a phase shifted left signal. The amount of phase shift introduced on each phase shifted signal is frequency dependent and varies from 0°–180° with low frequency components being 180° out of phase and the high frequency components substantially in phase. In addition another phase shift is introduced on at least one difference signal, to place a phase shift of less than 90° between the two difference signals. The two difference signals are then fed to the rear speakers in a four channel reproduction system.

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**3,745,255**

**RECEIVER WITH AN IMPROVED PHASE LOCK LOOP IN A MULTICHANNEL TELEMETRY SYSTEM WITH SUPPRESSED CARRIER**

**James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Stanley Butman, and Uzi Timor, both of Pasadena, Calif.**

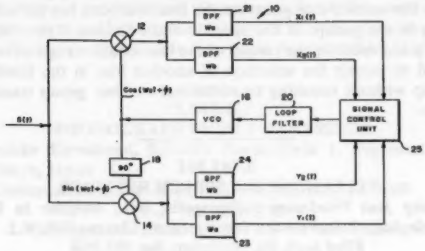
**Filed Aug. 18, 1971, Ser. No. 172,807**

**Int. Cl. H04j** *1/20*

**U.S. Cl. 179—15 FS** **11 Claims**

A phase lock loop is disclosed for a receiver in a two-channel PSK/PM telemetry system with a suppressed carrier. The receiver inphase channel output is filtered by first and second bandpass filters and the receiver quadrature channel output is filtered by third and fourth bandpass filters. The first and third filters have the same bandwidth, centered about the frequency of one subcarrier and is wide enough to pass data around the first harmonic of the subcarrier. The second and fourth bandpass filters have the same bandwidth centered about the frequency of the other subcarrier and is wide enough to pass

data around the first harmonic of this subcarrier. The outputs of the first and third filters are mixed in one mixer and the outputs of the second and fourth filters are mixed in another mixer. The outputs of the two mixers are weighted to produce a weighted sum signal which is supplied to the loop filter.

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**3,745,256**

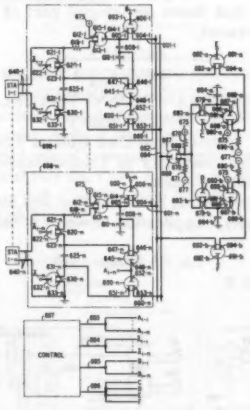
**TIME DIVISION SWITCHING ARRANGEMENT UTILIZING A HYBRID CIRCUIT**

**Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 20, 1971, Ser. No. 209,537**

**Int. Cl. H04j** *3/02*

**U.S. Cl. 179—15 AT** **19 Claims**



A time division communication system hybrid circuit transfers signals between a two-wire line and the incoming and outgoing paths of a four-wire line in two successive time intervals of a selected time slot. A signal from the incoming path is stored in a first store during the first time interval and the stored signal is coupled to the two-wire line. A second store is connected to the two-wire line to store the signal appearing on said two-wire line, including the coupled incoming signal and the outgoing signal from the two-wire line. During the second time interval, a portion of the first store signal is subtracted from the second store signal and the resultant difference signal is applied to the outgoing path.

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**3,745,257**

**PCM REGENERATIVE REPEATER**

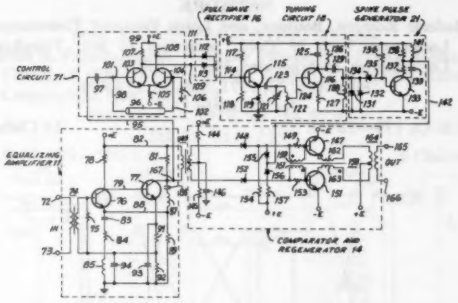
**Isao Fudemoto, Machida-shi, Tokyo; Shichi Kurita, Kawasaki-shi; Kiyoshi Tomimori, Kawasaki-shi, and Tatsuki Hayashi, Kawasaki-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed May 18, 1971, Ser. No. 144,489**

**Claims priority, application Japan, May 23, 1970, 45/44352**

**Int. Cl. H04b** *3/36*

**U.S. Cl. 179—16 E** **5 Claims**




A control circuit connected between an output of the equalizing amplifier and the i put of a full wave rectifier in a regenerative repeater increases the frequency component $f0/2$ of the output signals of the equalizing amplifier. The control circuit comprises a delay line providing a delay equal to the pulse repetition time of the output pulse train from the equalizing amplifier and a subtraction circuit for calculating the difference between the input signals to the delay line and the output signals of the delay line.

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**3,745,258**

**ADJUSTABLE REVERSIBLE TELECOMMUNICATION CODE SIGNAL CONVERTER**

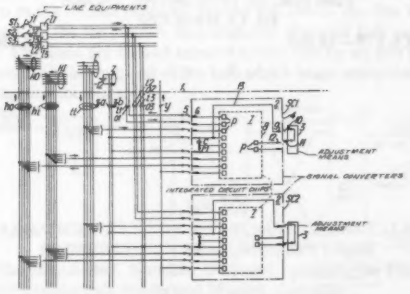
**Laurence William David Lawrence, Burlington, Ontario, Canada; Brian Goodwill Wells, Wollaton, England; Colin Bunting, Wilford, England, and John Dawson, Kirkby-in-Ashfield, England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland**

**Filed Oct. 12, 1971, Ser. No. 188,316**

**Claims priority, application Great Britain, Oct. 15, 1970, 48,982/70**

**Int. Cl. H04q** *3/72*

**U.S. Cl. 179—18 FH** **3 Claims**




Telecommunication signal conversion apparatus for converting a single pulse signal at an individual terminal into a complex signal – representing for example a subscriber's directory number – comprising a succession of two-out-of-five elements on a common highway, and vice versa, in dependence on adjustments made to the apparatus.

The apparatus (FIG. 1) comprises an adjustable converter (e.g. SC1) for each subscriber's line, a converter being adjusted to the number of the line it represents. A converter comprises a jack-in card (2) carrying an integrated circuit chip (7) which accommodates the circuitry, and adjustment plugs (3) representing digit values which are plugged on to the card as required.

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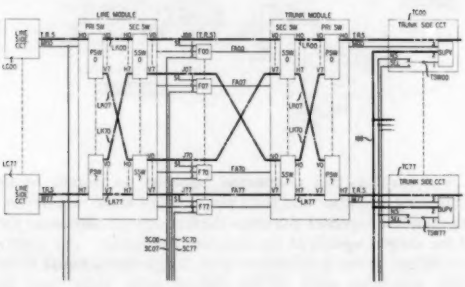
## 3,745,259
## PATH SELECTION CIRCUIT FOR AN END MARKED NETWORK

**Roderic Romero, Boulder, and Louis Emanuel Thelemaque, Longmont, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 23, 1971, Ser. No. 173,930**
**Int. Cl. H04q *3/49***
**U.S. Cl. 179—18 GE** **16 Claims**




A switching system is disclosed having an end marked network together with facilities for selecting any one out of a plurality of possible network paths for use on a connection between a preselected line side circuit and a preselected trunk side circuit. The successive use of these facilities enables all possible paths between the two preselected circuits to be seized one at a time.

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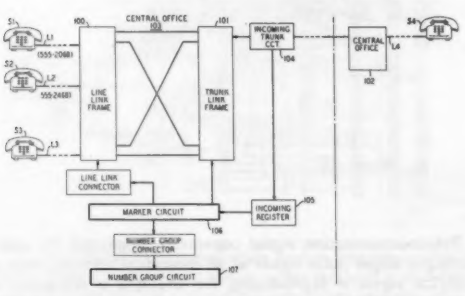
## 3,745,260
## TELEPHONE SWITCHING SYSTEM WITH LINE HUNTING

**Charles Andrew Anderson; John Mason Catterall, both of Columbus, Ohio, and Richard Maurice Swanson, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., by said Catterall and Swanson and Western Electric Company, New York, N.Y., by said Anderson**

**Filed Mar. 20, 1972, Ser. No. 236,485**
**Int. Cl. H04q *3/62***
**U.S. Cl. 179—18 HA** **13 Claims**




A common control telephone switching system featuring line hunting is disclosed. Using the dialed number, a marker circuit interrogates a number group translator to ascertain the line equipment location of the called line. The line location received from the number group is registered in the marker for use in selecting the called line. The marker also receives an indication as to how many lines are in the hunting group and how the marker can generate the line locations for the other lines in the group. In the specific embodiment, if the called line is unavailable, the output of the line location register is altered to permit the selection of another line in the hunting group without resorting to additional number group translations.

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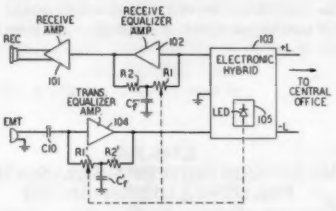
## 3,745,261
## TELEPHONE SET SPEECH NETWORK

**Stanley Joel Friedman, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Sept. 20, 1971, Ser. No. 182,060**
**Int. Cl. H04m *1/76***
**U.S. Cl. 179—81 R** **7 Claims**




In an electronic type telephone set employing an active resistive hybrid network in combination with separate transmit and receive feedback amplifiers, automatic equalization in terms of both frequency and volume is achieved by the use of a respective photoresistive device in each of the amplifier feedback paths. Each of the photoresistive devices is optically coupled to a common light-emitting diode in a line current sensing circuit that forms an integral part of the active resistive hybrid network.

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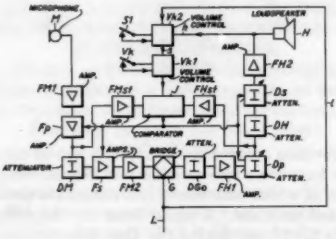
## 3,745,262
## AMPLIFIER ARRANGEMENT FOR TELEPHONE INSTRUMENT

**Ulf Erik Brolin, Handen, and Owe Gunnar Lindgren, Farsta, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Dec. 1, 1971, Ser. No. 203,599**
**Claims priority, application Sweden, Dec. 22, 1970, 17418/70**
**Int. Cl. H04m *1/00***
**U.S. Cl. 179—81 B** **7 Claims**




An amplifier arrangement for controlling the output level of an amplifier used in a two-wire line telephone system comprises an attenuation circuit, a memory circuit, an integration circuit and a test device. The output level of the amplifier is tested by the test device and if the output level is too high activates the integration circuit. When the output voltage of the

integration circuit exceeds a certain value the memory circuit changes state to (1) activate the attenuation circuit so that the output level of the amplifier is decreased, and (2) re-set the integration circuit. The memory circuit remains in its changed state until the direct voltage level of the two-wire line is essentially changed in which case the memory circuit is re-set to the original state and the attenuation circuit is no longer activated and the integration circuit may again be started by the test device.

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**3,745,263**

## PHONOGRAPH PICKUP CARTRIDGE

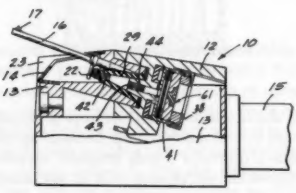
**Hirotake Kawakami, 8-3-303 Horino-Uchi 1, Suginami-ku, Tokyo, Japan**

**Continuation-in-part of Ser. No. 850,102, Aug. 14, 1969, Pat. No. 3,649,775**

**This application Dec. 20, 1971, Ser. No. 209,869**

**Int. Cl. H04r** *19/10*

**U.S. Cl. 179—100.41 K** **5 Claims**



A phonograph pickup cartridge which has a stylus with a pair of driving arms engageable with the ends of a pair of tapered flexible members and formed with tapered openings therein so that the movement of the stylus moves the flexible members and causes the volume of the air chambers therein to vary. A pair of electrostatic transducers are coupled to the cavities of the flexible members and have diaphragms which vary with variations in volume of the flexible members so as to produce audio output signals.

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**3,745,264**

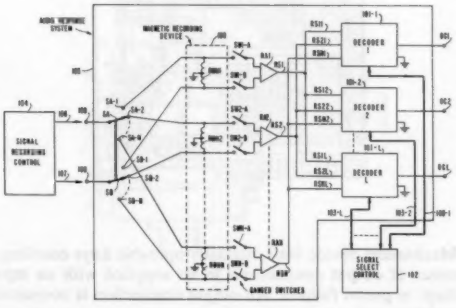
## ANALOG SIGNAL RECORDING AND PLAYBACK METHOD AND SYSTEM

**S. Thomas Emerson, Port Jefferson; W. Dwain Simpson, and Richard J. Sutter, both of Port Jefferson Station, N.Y., assignors to Periphonics Corporation, Rocky Point, N.Y.**

**Filed July 23, 1970, Ser. No. 57,489**

**Int. Cl. G11b** *27/32, 5/06*

**U.S. Cl. 179—100.2 MD** **125 Claims**



Apparatus and method for recording and reproducing analog signals. When used in a voice response system, audio signals are sampled at approximately a 5 kHz rate, and the samples are recorded on the track of a magnetic disc or drum. The record medium makes a single rotation in less time than it takes to record or reproduce a word. Thus, the samples are recorded in an interlaced format on the record medium. By storing samples only, much less storage capacity is needed for each signal than in the case where the continuous signal is recorded. The interlacing technique allows fast random access to any signal and does not require the use of buffering circuits. The samples are recorded in the form of pulse widths to provide extremely dense packing of information.

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**3,745,265**

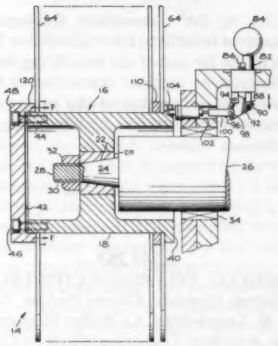
## DISC FILE HUB MOUNTING MEANS

**Stelios B. Papadopoulos, Westlake Village, and Frank Kupka, Thousand Oaks, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.**

**Filed Dec. 14, 1970, Ser. No. 97,912**

**Int. Cl. G11b** *25/04*

**U.S. Cl. 179—100.2 A** **6 Claims**



A hub assembly useful in a magnetic disc storage unit for supporting a plurality of discs. The assembly includes a horizontally supported hub internally engaged with a concentric drive spindle. The hub outer circumference is provided with two land areas spaced by 120°. The radial distance from the hub axis to each land area outer surface is selected to be equal to the inner disc radius. The remainder of the hub outer circumference is relieved to permit the discs to be easily installed on and removed from the hub. A mechanism is provided to selectively lock the hub in a position at which the two land areas are equally displaced by 60° from the vertical plane through the hub axis. By putting the discs on the hub when the hub is in the locked position, gravity will locate the disc inner surface on the land areas, and align the disc and hub central axes. The discs are locked relative to the hub by an end plate mounted on the free end of the hub which bears along the hub axis against the discs.

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**3,745,266**

## ARRANGEMENT FOR MEASURING CROSS TALK PROPERTIES IN TRANSMISSION LINES

**Martin Niedereder, Munich, Germany, assignor to Siemens Aktiegesellschaft, Berlin and Munich, Germany**

**Filed Mar. 29, 1971, Ser. No. 129,009**

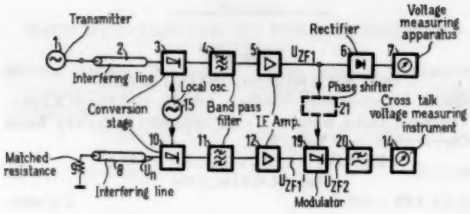
**Claims priority, application Germany, Apr. 10, 1970, P 20 17 275.2**

**Int. Cl. H04b** *3/46*

**U.S. Cl. 179—175.3** **5 Claims**

An arrangement to measure cross talk properties in transmission lines wherein an interfering line is connected to a

transmitter having an adjustable frequency and the far end of an interfered line is connected to a tunable superheterodyne receiver, and a voltage measuring system is provided at the output thereof. The reading data is obtained from the cross talk voltage measured during the tuning of the superheterodyne receiver to the transmission frequency. A superheterodyne receiver tunable to the transmission frequency can be connected to the far end of the interfering line, and tuning of the superheterodyne receiver connected to the interfered line is performed as a function of the tuning of the superheterodyne receiver connected to the interfering line.

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**3,745,267**

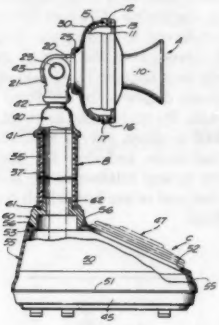
**ORNAMENTAL TELEPHONE CONSTRUCTION**

**Council A. Tucker, Glendale; George Perkins, Laguna Beach, and James H. Langworthy, La Habra Heights, all of Calif., assignors to American Telecommunications Corporation, El Monte, Calif.**

**Filed Nov. 22, 1971, Ser. No. 200,798**

**Int. Cl. H04m** *1/02*

**U.S. Cl. 179—179** **3 Claims**



An upright telephone construction has a base housing, an upright column on the base housing, a transmitter assembly pivotally secured on the column, and a receiver assembly coupled to the base. Each of these members has a thin ornamental covering over it. Two of three marginal edges of the base covering are protected by abutting ridges or flanges of the base housing. In the case of the third marginal edge of the base covering, column, transmitter and receiver, the marginal edges of the coverings are protected by overlying flanges.

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**3,745,268**

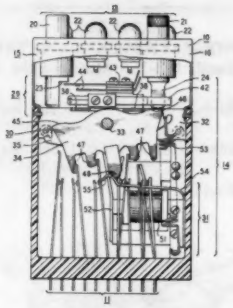
**SWITCH HAVING TWIN CONTACT OPERATOR CARDS**

**Thomas Harlon Barker, Westerville, Ohio, and Richard Stenglein, Batavia, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 18, 1972, Ser. No. 281,990**

**Int. Cl. H01h** *3/12*

**U.S. Cl. 200—1** **7 Claims**



A switch is disclosed in which two sets of contacts and two pushbuttons are combined with twin contact operator cards so that the contact operator cards respond simultaneously to pushbutton operation yet remain free to act independently of each other.

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**3,745,269**

**MECHANICAL DEVICE WITH MANUALLY OPERABLE KEYS FOR SUPPLYING VOLTAGE TO OUTPUT CHANNELS IN PRESET FASHION**

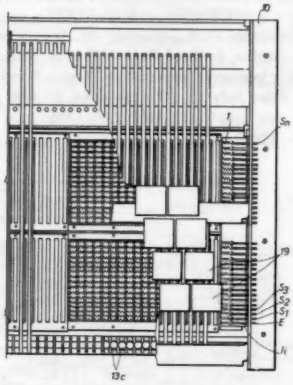
**Tibor Arvai, 14, rue de Berri, Paris, France**

**Filed Aug. 2, 1971, Ser. No. 168,290**

**Claims priority, application France, Aug. 10, 1970, 7029447**

**Int. Cl. H01h** *9/26, 5/06, 1/30*

**U.S. Cl. 200—5 EA** **11 Claims**

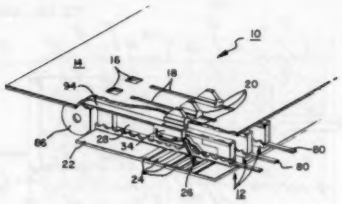


Mechanical device with manually operable keys enabling a number of output connections to be supplied with an input voltage in preset fashion. An output connection is connected to a tightly coiled helicoid conductor resting on successive insulating projections. A movable, electrically conducting blade operable by means of a key is in registry with an opening or space between a pair of successive projections whereby to be able to establish an electrical contact with certitude between said blade, when it is driven downwardly by pressing the key and the helicoid conductor.

## 3,745,270
## SLIDE SELECTOR SWITCH ASSEMBLY

Richard Francis Granitz, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 27, 1972, Ser. No. 238,212
Int. Cl. H01c *15/02*
U.S. Cl. 200—16 C 16 Claims



A mechanical slide selector switch assembly is described which includes a plurality of slide switches having contacts designed to selectively engage a plurality of conductive strips printed on a board of insulating material. Each individual slide switch includes a ball bearing detent assembly which renders the slide switch more reliable and less susceptible to wear. The ball bearing detent assembly lifts the sliding switch contacts away from the printed conductive strips as the contacts are moved from one position to another, and thereby reduces contact wear and erosion of the printed conductive strips. Each slide switch also includes a digital position readout assembly including a flexible tape with numerals printed on it.

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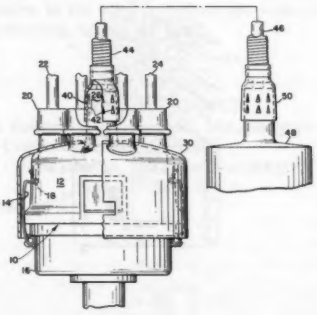
## 3,745,271
## DISTRIBUTOR CAP AND IGNITION SYSTEM PROTECTION MEANS

Joseph M. Brasty, Maple Heights, Ohio, assignor to Elizabeth Stokowski, Maple Heights, Ohio

Filed Jan. 31, 1972, Ser. No. 222,208
Int. Cl. H01h *19/04*; H01r *11/24*
U.S. Cl. 200—19 DC 7 Claims

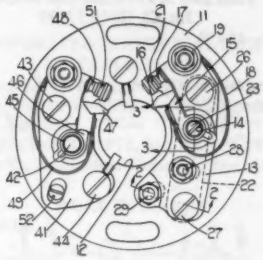


In a vehicle ignition system including a distributor having a removable cap thereon, an auxiliary cover positioned over the distributor and its cap and covering the distributor cap attaching means, and means permanently securing this auxiliary cover to the distributor cap to prevent unauthorized access thereto.

## 3,745,272
## CONTACT BREAKER ASSEMBLY WITH IMPROVED ADJUSTABLE DISTRIBUTOR MOUNTING PLATE AND LOCKING PLATE MEANS

Geoffrey Ralph Mosby, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 22, 1971, Ser. No. 200,707
Claims priority, application Great Britain, Nov. 24, 1970, 55,722/70
Int. Cl. H01h *9/02*
U.S. Cl. 200—31 A 10 Claims



A contact breaker assembly for use in the ignition system of an internal combustion engine includes a mounting plate arranged to mount the contact breaker assembly adjacent a rotatable cam. An angle plate is supported on one face of the mounting plate and the angle plate carries a fixed electrical contact and also pivotally supports an insulating heel member carrying a movable contact. The insulating heel member includes a cam follower engageable by the cam in use, and resilient means urges the heel member to pivot in a direction towards the cam so as to engage the movable contact with the fixed contact. A locking plate is engaged with the face of the mounting plate remote from the angle plate and a pivot post extends between the locking plate and the angle plate through the mounting plate, the pivot post positioning the angle plate for pivotal movement relative to the mounting plate about the axis of the heel member. First and second rotatable eccentric adjustment devices act between the angle plate and the mounting plate and are operable respectively to move the angle plate relative to the mounting plate in a manner to adjust the position of the cam follower of the heel member around the periphery of the cam and towards and away from the cam. Locking screws are provided to lock the angle plate against movement relative to the mounting plate.

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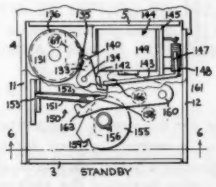
## 3,745,273
## MOTOR RELEASE ENERGY STORAGE MEANS FOR RETARDED TYPE TIMER MECHANISM

John L. Harris, Delafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Sept. 10, 1971, Ser. No. 179,422
Int. Cl. H01h *7/08*, *43/10*
U.S. Cl. 200—40 20 Claims




A heavy duty contactor mechanism for refrigeration compressor motors is directly actuated by a timing mechanism controlled by a thermostat. The timing mechanism protects

against false starts from thermostat vibration, and interposes a delay between stopping and starting of the compressor sufficient to allow pressures to equalize. Power for operating the contactor switches is stored in a spring while the timer motor is running through the delay period.

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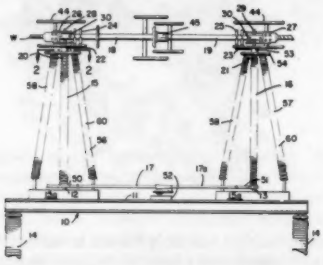
**3,745,274**

**TRIPOD-SUPPORTED ELECTRIC DISCONNECT SWITCH FOR HIGH-VOLTAGE ELECTRIC POWER SYSTEMS**

**Fred H. Cole, 1028 S. Sierra Bonita Avenue, Los Angeles, Calif.**

**Filed July 3, 1972, Ser. No. 268,476**
**Int. Cl. H01h** *31/00*
**U.S. Cl. 200—48 CB** **6 Claims**



An electric disconnect switch is disclosed having a pair of spaced terminals which include axially aligned switch blades thereon which move into and out of engagement with each other upon rotation of a pair of vertically extending insulated leg members connected to each of the terminals. A tripod support is associated with each leg member, the support including at least three spaced insluated inclined legs connected at their lower ends to a base supporting the leg member and extending to the top of the leg members.

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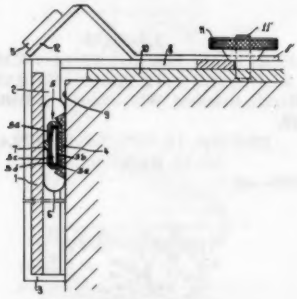
**3,745,275**

**TOUCH PAD FOR SWIMMING COMPETITIONS**

**Louis Degiez, Nidau, Switzerland, assignor to OMEGA Louis Brandt & Frere S.A., Berne, Switzerland**

**Filed June 25, 1971, Ser. No. 156,658**
**Claims priority, application Switzerland, July 7, 1970, 10262/70**
**Int. Cl. H01h** *35/00*
**U.S. Cl. 200—52 R** **15 Claims**



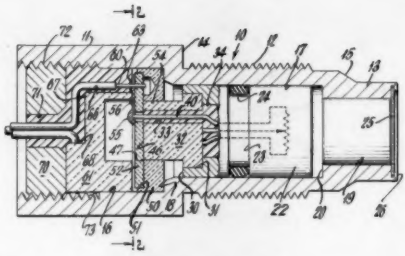
A touch pad for swimming competitions mounted on the finishing wall of a swimming pool, including a striker plate movable in a direction perpendicular to the finishing wall and compressible cables between the striker plate and finishing wall, an electric circuit being closed when a cable is compressed, and supporting means being located between the cables and the finishing wall for bridging irregularities of the finishing wall.

**3,745,276**

**CIRCUIT BREAKING DEVICE**

**James H. McPherson, Succasunna, N.J., assignor to Cartridge Actuated Devices, Inc., Fairfield, N.J.**

**Filed Mar. 1, 1972, Ser. No. 230,622**
**Int. Cl. H01h** *35/00*
**U.S. Cl. 200—61.08** **9 Claims**



A device for breaking a circuit which comprises an anvil and a cutter cooperating with the anvil and a printed circuit board between the anvil and cutter, the circuit to be broken comprising conductors in each of the cutter and anvil and a connection between those conductors through the printed circuit board. Actuation of the device, for example by an explosive cartridge, causes the cutter to move toward the anvil and break a piece from the printed circuit board and at the same time to break the connection between the conductors of the anvil and cutter.

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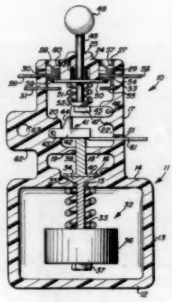
**3,745,277**

**IMPACT FIRE PROTECTIVE SWITCH FOR MOTOR VEHICLES**

**George A. Shawcross; Ian Shawcross, and Kevin Shawcross, all of 233 Sunnyland Drive, San Antonio, Tex.**

**Filed July 10, 1972, Ser. No. 270,040**
**Int. Cl. H01h** *35/02*
**U.S. Cl. 200—61.5** **10 Claims**



This invention relates to an impact switch which is designed for installation in a motor vehicle for interrupting all of the electrical circuits in the vehicle when the latter is involved in a collision. A tiltable weight member trips a latch assembly thereby causing a movable contact to engage a predetermined fixed contact assembly. The impact switch also includes a manually operable trip for cutting out the circuits under other conditions.

## 3,745,278
## DIRECTION INDICATOR SWITCHES WITH CANCELLING MECHANISM

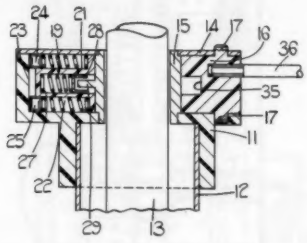
**Norman Wilkinson, Barrowford, Near Nelson, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Dec. 3, 1971, Ser. No. 204,608**

**Claims priority, application Great Britain, Dec. 12, 1970, 59,189/70**

**Int. Cl. H01h** *3/16*

**U.S. Cl. 200—61.27** **5 Claims**




A direction indicator switch for a road vehicle having a central off position and operative positions on opposite sides respectively of the off position and detent means for resisting movement of the rotor of the switch relative to the base of the switch from any one of the positions of the switch. The switch includes electrical contacts operable in the operative positions of the rotor to complete electrical circuits to indicator lights on opposite sides respectively of the vehicle in use. The rotor carries first and second cancelling members which are resiliently urged to respective rest positions on the rotor, the cancelling members being out of the path of movement of a striker carried by the steering wheel of the vehicle when the rotor is in its off position. The cancelling members are engageable respectively by the striker in the operative positions of the rotor and the arrangement is such that during cancelling movement of the striker the striker engages one or other of the cancelling members and applies thereto a force to rotate the rotor its off position. The resistance to movement of the cancelling member is so chosen as to be in excess of the resistance to movement of the rotor imparted by the detent means so that the rotor is moved relative to the base in preference to movement of the cancelling member relative to the rotor. However, the resistance to movement of the cancelling member is such that if the rotor is held against its return movement, for example, manually, then the cancelling member is moved relative to the rotor to permit the striker to pass the cancelling member.

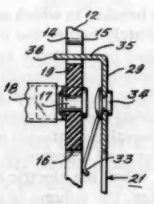
## 3,745,279
## CONTACT SWITCH

**William J. Zollmann, Jr., Foristell, Mo., assignor to Wagner Electric Corporation, Newark, N.J.**

**Filed June 26, 1972, Ser. No. 266,077**

**Int. Cl. H01h** *35/10*

**U.S. Cl. 200—80 R** **14 Claims**




A switch mechanism for controlling a start winding circuit of an electric motor is provided with a support plate having a contact thereon for connection in said circuit, and a current carrying switch member is pivotally mounted on said support plate for circuit making and breaking engagement with said contact. A tab is integrally provided on the switch member extending through a slot in the support plate and defining with one side of said support plate a pivot for said switch member, and a quick disconnect device for connection in said circuit is connected in displacement preventing and current transmitting engagement with said tab adjacent to the other side of said support plate including a portion for abutting engagement with said support plate other side adjacent to the slot.

## 3,745,280
## PRESSURE-OPERATED ELECTRICAL HIGH VOLTAGE CIRCUIT BREAKER

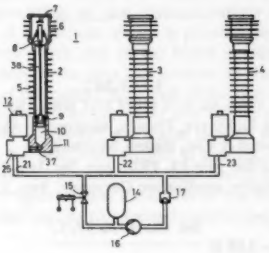
**Rudolf Pratsch; Helmut Beier, and Klaus Diskar, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Dec. 13, 1971, Ser. No. 207,293**

**Claims priority, application Germany, Dec. 18, 1970, P 20 64 798.7**

**Int. Cl. H01h** *35/38*

**U.S. Cl. 200—82 B** **7 Claims**




A receiving vessel for displaced hydraulic fluid is positioned at the cylinder of the drive mechanism of an electrical circuit breaker having a hydraulic drive. The receiving vessel is connected via a valve to the hydraulic system which includes a storage unit and a low pressure vessel. The connection is provided via a single pipeline between the receiving vessel and the hydraulic system. The valve connects the pipeline with either the receiving vessel or the cylinder, depending upon the pressure. The circuit breaker is especially suitable for high voltage, high capacity operation.

## 3,745,281
## GAS-BLAST CIRCUIT BREAKER HAVING A FLOATING PUFFER PISTON DRIVEN BY ELECTROMAGNETIC FORCE

**Yoshio Yoshioka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 22, 1971, Ser. No. 117,415**

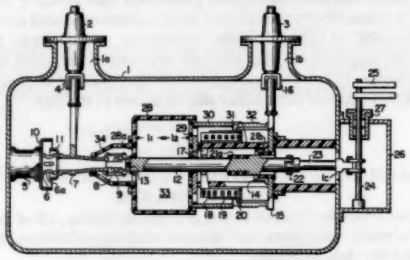
**Claims priority, application Japan, July 1, 1970, 45/56919; Mar. 11, 1970, 45/20163; Feb. 20, 1970, 45/14190**

**Int. Cl. H01h** *33/82*

**U.S. Cl. 200—148 R** **22 Claims**

A gas breaker wherein an electromagnetic force is generated between a primary coil fixed to an operating rod manipulating a movable contact element and an end ring or a short ring fixed to a floating puffer piston slidably supported against said operating rod, said floating puffer piston being driven to compress arc-extinguishing gas in said puffer cylinder by an electromagnetic repulsive force and an arc is extinguished by compressed arc extinguishing gas which is blasted to the contact element.

A movement of the puffer piston for compressing arc-extinguishing gas is shut off from that of the operating rod, so that the electromagnetic repulsive force is utilized for compression



of the arc-extinguishing gas in the puffer cylinder, whereby the electromagnetic force is not effected to the operating rod, thus resulting in making the control system for the operating rod more compact.

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**3,745,282**

## GAS-BLAST CIRCUIT BREAKER

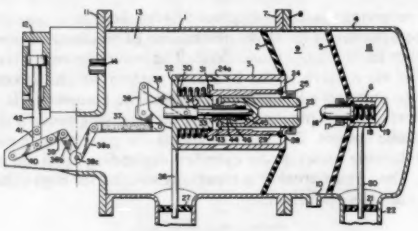
**Robert Dides, Le Havre, France, assignor to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland**

**Filed July 22, 1971, Ser. No. 164,992**

**Claims priority, application Germany, Aug. 1, 1970, P 20 38 338.4**

**Int. Cl. H01h *33/57***

**U.S. Cl. 200—148 B** **2 Claims**



A circuit breaker of the gas-blast type includes an essentially stationary contact member and a movable nozzle contact member actuated by a drive mechanism and through which gas stored in the contact chamber at high pressure passes to a low-pressure chamber to facilitate arc extinction. A blast valve controlling gas flow through the nozzle contact to the low-pressure chamber includes a movable sleeve surrounding the nozzle contact which is spring loaded to a closed position in the rest position of the contacts, i.e., open or closed, but is entrained temporarily by the movable nozzle contact member through a temporarily effective interlocking mechanism therebetween immediately upon its disengagement from the stationary contact member so as to effect a temporary opening of the blast valve simultaneously with contact disengagement to blast and extinguish the arc, the valve sleeve being returned to its closed position by its spring loading as soon as it is released from the movable contact member.

**3,745,283**

## ELECTRICAL COMPRESSION SWITCH

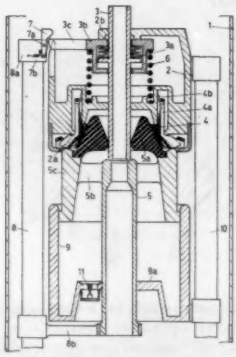
**Walter Bischofberger, Zurich, and Gerhard Mauthe, Wettingen, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland**

**Filed Nov. 30, 1971, Ser. No. 203,278**

**Claims priority, application Switzerland, Dec. 14, 1970, 18503/70**

**Int. Cl. H01h *33/54***

**U.S. Cl. 200—148 R** **6 Claims**



An electrical switch of the compression type wherein gas for arc extinction is compressed prior to disengagement of the contacts by movement of the driven contact itself includes a pair of contact studs arranged coaxially in end-to-end relation. One of the contact studs is positively driven, and the other contact stud which performs a follower function so as to remain temporarily in engagement with the driven contact while the gas is being compressed is mounted elastically within a movable housing structure biased to a rest position by a return spring. The housing structure is coupled to the driven contact stud by a latching mechanism such that the housing structure and follower contact stud are taken along with the driven contact stud during the gas-compressing phase of contact movement. Thereafter the latch mechanism releases thus uncoupling the spring biased housing structure and follower contact stud and permitting them to reverse direction and snap back quickly to the rest position thereby expediting disengagement of the follower contact stud from the driven contact stud as the latter continues to move in the contact separating direction, and at which time the compressed gas is released for flow into the gap formed between the ends of the contact studs.

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**3,745,284**

## GAS BREAKERS

**Masao Hosokawa, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed May 16, 1972, Ser. No. 253,712**

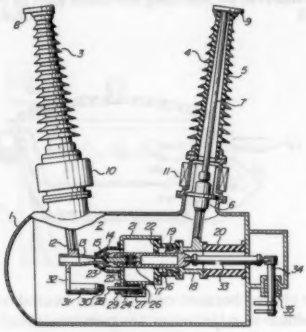
**Claims priority, application Japan, May 21, 1971, 46/34045; May 21, 1971, 46/34047; Nov. 12, 1971, 46/89817; Nov. 22, 1971, 46/93152**

**Int. Cl. H01h *33/70***

**U.S. Cl. 200—148 A** **14 Claims**

In a puffer type gas breaker in which an arc-suppressing gas is compressed immediately before the current is broken and the resultant pressurized gas is blown against the arc formed between contactors thereby to extinguish said arc, an auxiliary cylinder is provided along the outer wall of a puffer cylinder in which the arc-suppressing gas is compressed, and a piston to operate a resistance movable contactor is slidably disposed in said auxiliary cylinder and constantly urged in a closing direction by a spring. When the electric circuit is to be closed after it has been broken, the volume of the puffer cylinder is expanded contrary to the case when the circuit is broken and, therefore, $SF_6$ gas pressure in said puffer cylinder becomes lower than the pressure of the gas enclosing the contactor, so

that the piston is moved in a closing direction by virtue of the gas pressure difference against the biasing force of the spring and hence the resistance movable contactor is brought into its closing position, whereby resistance is positively inserted into the power transmission line prior to closing of main contactors. After the main contactors are closed, the resistance



movable contactor is moved in a breaking direction by the spring through the piston as the $SF_6$ gas pressure is restored in the puffer cylinder, and therefore, main contactors can be disconnected from each other immediately after a breaking command is given. This enables the breaking time to be shortened and makes a high speed breaking operation possible.

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**3,745,285**

## SILENCER FOR HIGH-VOLTAGE GAS-BLAST CIRCUIT BREAKER

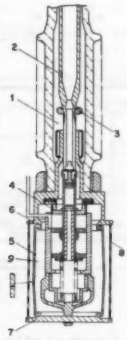
**Wilhelm Kramer, Sandhausen, and Dieter Schnee, Mannheim, both of Germany, assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland**

**Filed May 19, 1972, Ser. No. 254,963**

**Claims priority, application Germany, June 9, 1971, P 21 28 632.8**

**Int. Cl. H01h** *33/58*

**U.S. Cl. 200—148 C** **7 Claims**



A silencer for a high-voltage circuit breaker of the gas-blast type includes an expansion chamber into which pressurized gas from the switch contact chamber flows after passing through one of the contact members and a discharge valve. The wall of the expansion chamber is at least partially constructed from a rubber-elastic material having pores which open only when back pressure builds up within the chamber thus appreciably silencing the gas as it escapes from the chamber into the surrounding atmosphere. In order to prevent damage to the expandable wall, its expansion is limited by enclosing it within a rigid perforated jacket.

**3,745,286**

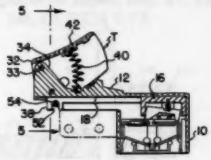
## TRIGGER OPERATED TOOL HANDLE SWITCH

**Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products Inc., Northfield, Ohio**

**Filed Apr. 1, 1971, Ser. No. 130,384**

**Int. Cl. H01h** *9/06*

**U.S. Cl. 200—157** **1 Claim**



A trigger operated electric switch for portable electric motor-driven tools including a switch casing having an integral extended frame portion with a trigger actuated switch device disposed in the casing. A contact carrier is disposed in the casing and has an integral elongated arm extending outwardly from the carrier in the direction of the frame portion. The contact carrier is disposed in the casing and frame portion for reciprocation therein along the longitudinal axis of the carrier. The contact carrier contains a portion of the switch device whereby reciprocation of the contact carrier actuates the switch device. A bell-crank trigger is pivotally mounted at its apex on the free outer end of the frame portion above the outer end portion of the arm for rotation in the longitudinal vertical plane of the carrier. One end of the bell-crank trigger is pivotally connected to the outer end of the arm, and bias means is disposed between the frame portion and the outer end portion of the bell-crank trigger to bias the switch device to a first preselected position. Displacement of the outer end portion of the trigger against the action of the bias means displaces the contact carrier to a second preselected position.

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**3,745,287**

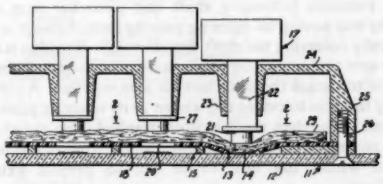
## KEY OPERATED SWITCH WITH DEPRESSIBLE BRIDGING CONTACT LAYER OF MATTED UNWOVEN ELECTRICALLY CONDUCTIVE FIBERS

**Winston G. Walker, Anaheim, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.**

**Filed Oct. 1, 1971, Ser. No. 185,677**

**Int. Cl. H01h** *13/52, 13/06, 1/06*

**U.S. Cl. 200—159 B** **8 Claims**



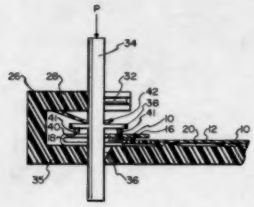
A key operated diaphragm type switch comprising a printed circuit board base having conductors thereon, a flexible sheet of non-conductive material supported in taut condition over the base and having an opening therein aligned with adjacent terminal portions of certain of the conductors, and a layer of unwoven matted metal fibers on the order of .10 in. thick overlying the sheet. Upon depression of the key, the underlying portion of the metal fiber layer and the flexible sheet are pressed toward the base. The portion of the metal fiber layer underlying the key is deformed through the opening in the flexible sheet and into bridging contact with the conductors to close the switch.

**3,745,288**

## FLEXIBLE PRINTED WIRING SWITCH

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 7, 1972, Ser. No. 278,498
Int. Cl. H01h 1/00
U.S. Cl. 200—166 PC 9 Claims




An electrical switch formed of a single flexible printed wiring element having a plurality of circuits to be selectively coupled and a shorting circuit. The flexible printed wiring element is folded upon itself such that the circuits to be coupled and the shorting circuit are facing. An actuator is provided to selectively urge the shorting circuit into and out of contact with the circuits to be coupled. Sliding and pushbutton embodiments of the invention are described.

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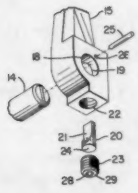
**3,745,289**

## ACTUATOR FOR A LIMIT SWITCH CONSTRUCTION OR THE LIKE

George M. Hipple, Jackson Township, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 2, 1972, Ser. No. 249,536
Int. Cl. F16c 3/00
U.S. Cl. 200—172 A 14 Claims




An actuator for a limit switch construction or the like having a rotatable actuating shaft and a rocker arm carried thereby and having an opening passing therethrough and telescopically receiving the shaft therethrough. A wedge is carried by the arm and is wedged between the shaft and the arm at the opening to secure the shaft and the arm together. A pin is carried by the arm to orient the wedge to its wedging position for the shaft even when the arm is unattached from the shaft. All of the means for securing the shaft to the arm are entirely embedded within the arm so as not to project externally therefrom.

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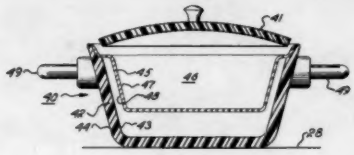
**3,745,290**

## INDUCTIVELY HEATABLE UTENSILS OR VESSELS FOR HEATING, SERVING AND STORING FOOD

John D. Harnden, Jr., and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1972, Ser. No. 230,892
Int. Cl. H05b 1/02
U.S. Cl. 219—10.49 15 Claims

Disclosed herein are various single wall and double-walled inductively heatable vessels for heating, serving and storing food. In general, each vessel is comprised of an inductively heatable inner part, or inner section, and an outer part, or outer section, which is not inductively heatable. For example, immediately after the vessel and food contained therein has been inductively cooked, or heated, on an induction appliance, the vessel may be rested directly on the surface of a conventional dining table without fear of burning the surface of the dining table and without fear that any of the diners will burn themselves by touching the outer part of the vessel. Such




fears are abated because only the non-heated outer part of the vessel which is near room temperature touches the dining table and is safely accessible to the diners. The inductively heatable inner part, or section, of the vessel may be comprised of a vapor-deposited metallic coating, metallic foil or sheet composite thereof, embedded powdered metal or coiled wires while the non-heated outer part or section may be comprised of suitable thermal insulation material such as plastics, glass, or ceramics, etc.

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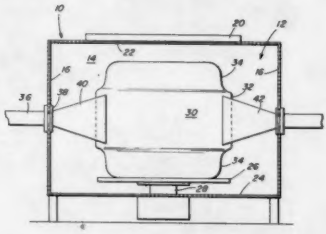
**3,745,291**

## MICROWAVE HEATING APPLICATOR

Robert A. Peterson, Canton, and Charles L. Gilliatt, Andover, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 18, 1972, Ser. No. 227,547
Int. Cl. H05b 9/06
U.S. Cl. 219—20.55 10 Claims



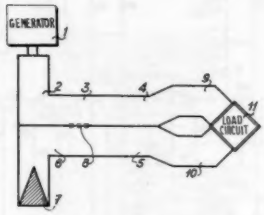

An apparatus for and method of heating or preheating articles with microwave energy. The article is rotatably disposed within an enclosure adapted to be radiated with electromagnetic energy at 915 and/or 2450 MHz by waveguide means terminating in a radiator, such as a flared horn. The end of the radiator is shaped to conform to any article, for example, pneumatic type rubber tires having annular shaped bodies for preheating prior to vulcanization or recapping. Multimode distribution of energy within the enclosure is achieved without resort to mode stirrers. Means are disclosed for altering the displacement of the articles during heating, either vertically or angularly, to provide uniform heating across the article surface.

3,745,292

## HEATING DEVICES FOR CARRYING OUT HIGH FREQUENCY HEATING BY DIELECTRIC LOSSES

Claude Couasnard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 29, 1972, Ser. No. 230,346
Claims priority, application France, Mar. 9, 1971, 7108089
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 6 Claims



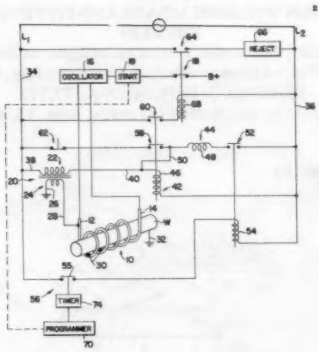

The dielectric loss heating devices of the invention apply high-frequency energy to a load circuit in which the component to be heated is placed, through the medium of a 3 dB directional coupler. The two outputs of said coupler, which carry equal energy fractions, are coupled to said load circuit in order that there propagate through same two independent waves whose polarisation directions are perpendicular to one another. The waves reflected by the object being heated are dissipated in a matched load connected to the fourth channel of the coupler, thus protecting the high-frequency generator.

3,745,293

## GROUND DETECTOR IMPROVEMENT

Richard F. Seyfried, Parma Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Mar. 7, 1972, Ser. No. 232,483
Int. Cl. H05b 5/08
U.S. Cl. 219—10.75 14 Claims



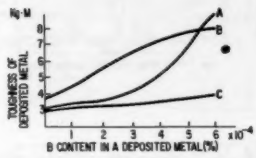

An auxiliary electric control circuit is provided for an induction heating system. The auxiliary circuit is adapted to detect a short circuit between the inductor of the system and a workpiece associated in induction heating relationship therewith, and is operable in response to such a short to disconnect the inductor from its power supply and eject the workpiece from the inductor. The auxiliary circuit is also adapted, selectively, to pass a current through the inductor and workpiece and through metal chips or the like therebetween to burn the metal chips away and thus eliminate or reduce nuisance short-circuits otherwise caused by the presence of such chips during an induction heating process.

3,745,294

## METHOD OF SUBMERGED ARC WELDING HIGH TENSILE STRENGTH STEEL HAVING TRACE ELEMENTS OF VANADIUM OR NIOBIUM

Masayasu Arikawa; Motomi Kano, both of Fujisawa, and Naoki Okuda, Kamakura, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Dec. 28, 1970, Ser. No. 101,509
Claims priority, application Japan, Dec. 27, 1969, 45/1848
Int. Cl. B23k 9/18
U.S. Cl. 219—73 3 Claims



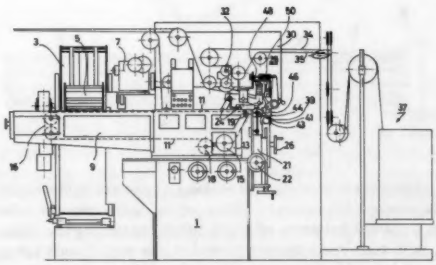

Steel is welded by submerged arc welding techniques using a steel wire comprising 0.2–2.5% Mn, 0.002–0.05% B and one or more of 0.005–0.5% Ti, Al and Zr and optionally a flux composition comprising a non-metallic flux powder and a metallic powder. The metallic powder contains 5–75% Fe, less than 5% Si and less than 10% Mn.

3,745,295

## METHOD FOR AUTOMATIC MANUFACTURE OF METAL CONTAINER BODIES, AND WELDING MACHINE FOR APPLICATION THEREOF

Paul Jakob Opprecht, Im hinteren Bernold, 8953 Bergdietikon, Switzerland

Filed Jan. 27, 1971, Ser. No. 110,015
Claims priority, application Switzerland, Feb. 10, 1970, 1868/70; Jan. 7, 1971, 172/71
Int. Cl. B23k 11/16
U.S. Cl. 219—64 2 Claims

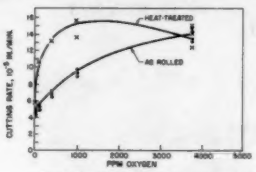


A method for automatic manufacture of metal container box utilizing a welding machine with electrode rolls by stacking and rounding the blanks and moving the round bodies on two conveying systems toward the welding point, the speed of the round body being reduced before reaching the welding point and the round body being transferred to the second conveying system for its feed to the welding point, the speed of the first conveying system being substantially greater than the speed of the second conveying system.

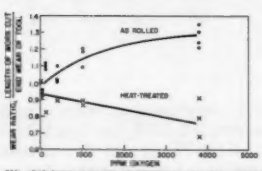
## 3,745,296
## COPPER TOOL MATERIAL FOR ELECTRICAL DISCHARGE MACHINING

George Shinopulos, Burlington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 20, 1971, Ser. No. 173,443
Int. Cl. B23p *1/08, 1/04*
U.S. Cl. 219—69 E 7 Claims




EDM CUTTING RATE VS. OXYGEN CONCENTRATION



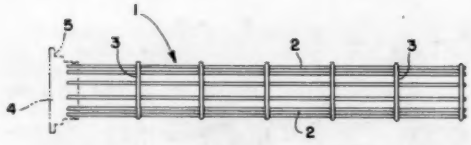

EDM WEAR RATIO VS. OXYGEN CONCENTRATION OF Cu TOOL MATERIAL

A new electrode material for electrical discharge machining consisting essentially of copper containing a critical oxygen content is disclosed. The novel electrode shows an increase in wear resistance of up to 30 percent over presently known electrode materials and after heat treatment shows an increase of cutting speed three-fold over oxygen free copper electrodes.

## 3,745,297
## APPARATUS FOR MAKING A CAGE ASSEMBLY

William J. Peshina; William F. Peshina, both of North Royalton, and Roger F. Stevers, Cleveland, all of Ohio, assignors to Royal Wire Products Inc., North Royalton, Ohio

Filed June 28, 1972, Ser. No. 266,978
Int. Cl. B23k *11/10*
U.S. Cl. 219—56 15 Claims

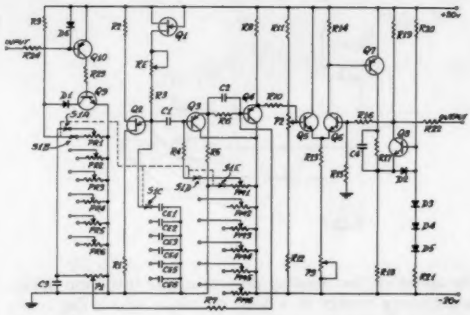



An apparatus is provided for making a cage assembly having interconnected linear and endless wires. Such apparatus includes a cylindrical array of guide tubes containing the linear wires, with such wires being exposed at one end of such tubes; a support assembly for maintaining one of the endless wires in proper position relative to the exposed portion of the linear wires; a plurality of radially movable inner and outer welding electrodes adapted to spot weld the endless wire to the linear wires; and an indexing piston-cylinder assembly adapted uniformly to advance the welded linear and endless wires for subsequent spot welding of another endless wire. The inner electrodes are superimposed upon electrode holders adapted radially to be moved by an arbor cam reciprocated by a control piston-cylinder assembly, such control piston-cylinder assembly being axially aligned with and reciprocated by the indexing piston-cylinder assembly.

## 3,745,298
## FREQUENCY GENERATOR FOR ELECTRICAL DISCHARGE MACHINING

Allan B. Malesh, Homewood, Ill., assignor to Abet Industries Corp., Broadview, Ill.

Filed Sept. 3, 1971, Ser. No. 177,803
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 C 17 Claims

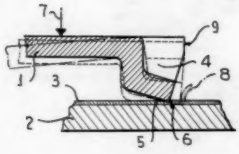


A frequency generator for use with electrical discharge machining devices to afford automatic control of the operational duty cycle, such control being effected by monitoring cutting conditions at the cutting area or gap, reducing the duty cycle whenever the gap voltage falls below a predetermined voltage which is substantially in excess of zero voltage to automatically reduce the predetermined normal duty cycle by an amount proportional to the amount by which said gap voltage falls below said predetermined voltage, the monitoring means being continuously operable to monitor the gap voltage and thereby maintain the duty cycle at a level reduced from the normal duty cycle by an amount proportional to the amount which the gap voltage is below the predetermined voltage and to adjust the duty cycle to a predetermined minimum duty cycle if the gap voltage is reduced to zero volts.

## 3,745,299
## PROJECTION WELDING MEANS AND FITTING FOR USE THEREIN

Adolf Schmidt, Karlsruhe, Germany, assignor to Schmalbach-Lubeca-Weke Aktiengesellschaft, Braunschweig, Germany

Filed Sept. 3, 1971, Ser. No. 177,712
Claims priority, application Germany, Sept. 15, 1970, P 20 45 495.9
Int. Cl. B23k *11/10*
U.S. Cl. 219—93 5 Claims

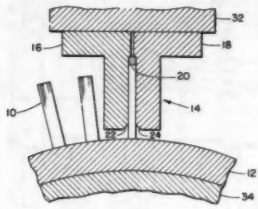



This disclosure relates to a projecting welding process wherein one of the parts to be welded has a coating layer formed of an electrically nonconductive material and wherein the removal of this coating layer at the desired point of weld is automatically accomplished in the application of a second part to the first part. The second part is provided with one or more projections each of which is slightly deformable and which has a cutting edge which is shifted relative to the first part during pressure application of the second part relative to the first part in a normal welding process to effect a localized cutting away of the coating layer and thus provide for metal-to-metal contact.

## 3,745,300
## WELDING BLADES TO ROTORS

Kenneth H. Holko, Chulavista, Calif., and Thomas J. Moore, Berea, Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 16, 1971, Ser. No. 134,658
Int. Cl. B23k *11/04*
U.S. Cl. 219—107 12 Claims

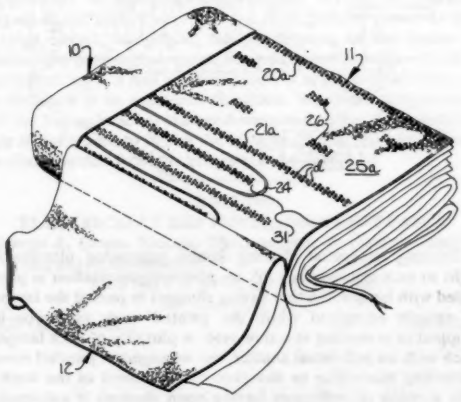



Using magnetic force upset welding to form T-joints between dissimilar thickness parts. This type of resistance welding is used to join compressor and turbine parts thereby reducing the weight and cost of a jet engine.

## 3,745,301
## ELECTRIC BLANKET AND METHOD OF FORMING SAME

Ernest Kohn Sherrill; James M. Hall, and Ralph G. Barnard, all of Rockingham, N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Nov. 12, 1971, Ser. No. 198,109
Int. Cl. H05b *1/00*
U.S. Cl. 219—212 15 Claims

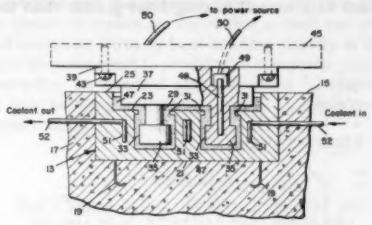



An electrically heated blanket and method of forming the same in which two layers of textile fabric are interconnected along spaced parallel lines by rows of small discrete dots of adhesive material to form a series of dividers with adjacent dividers defining parallel open-ended channels therebetween in which electric heating wire is positioned.

## 3,745,302
## LOCKING DEVICE FOR AN ADJUSTABLE SUPPORT SYSTEM

David A. Bond, Rolling Hills, Calif., assignor to Agbabian-Jacobson Associates, El Segundo, Calif.

Filed June 24, 1971, Ser. No. 156,432
Int. Cl. H05b *3/06*
U.S. Cl. 219—213 2 Claims

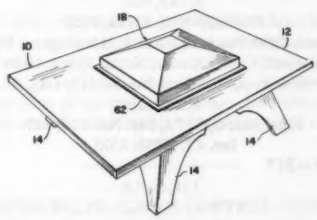



In a system for adjusting the position of a structure relative to its foundation and thereafter rigidly securing the structure in the exact position of adjustment, there is herein disclosed a locking device including a meltable matrix material disposed in an opened-top cavity in a base and also including a support member extending into the matrix material which material rigidly holds the support member in a fixed position until a heating element in the support member is activated. Once freed, the structure may be moved by any conventional auxiliary mechanism, and when so aligned the support member is again locked by deactivating the heating element.

## 3,745,303
## GRILL-HEATER FOR RESTAURANT TABLE

Charles N. Epperson, and Roy A. Human, both of 1203 S. Wood Drive, Okmulgee, Okla.

Filed Oct. 18, 1971, Ser. No. 190,074
Int. Cl. H05b *1/00*
U.S. Cl. 219—218 5 Claims




A grill-heater for a restaurant table or the like comprising a housing projecting downwardly into a recess in the table and having a heater element mounted adjacent the bottom of the housing, an inner grid member mounted in the housing above the electrical heating element, a plurality of heat storing units, such as stones or rocks, supported on the inner grid member, and an outer grill member mounted at the top of the housing and being adapted to support food, such as steaks, thereon to heat or cook the same.

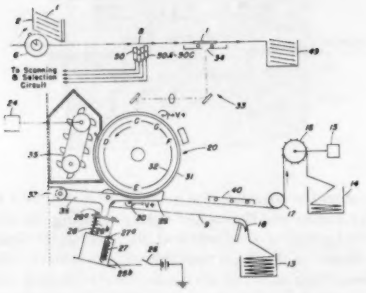
## 3,745,304
## SELECTIVE FUSING

Mark A. Hutner, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 17, 1972, Ser. No. 235,571
Int. Cl. H05b *3/00*
U.S. Cl. 219—216 21 Claims

Fuser regulating methods and the apparatus therefor are provided in accordance with the teachings of the present in-

vention wherein a fuser assembly is selectively energized to obtain variable heating levels in accordance with the intermittent movement of successive portions of a support base through the fuser assembly such that said fuser assembly rapidly attains an operating temperature sufficient to fuse to said support base the electroscopic particles supported thereon. The fuser assembly is energized to a first heating level when successive portions of the support base are moved therethrough within a first time duration. The fuser assembly is energized to a second heating level greater than the first



level when a first interval of time has expired since the immediately preceding energization thereof. If a second interval of time has expired since the immediately preceding energization of the fuser assembly, the assembly is energized to a third heating level when the next successive portion of the support base is advanced thereto. The second interval of time is greater than the first interval of time and the third heating level is greater than the second heating level. Further levels of energization may be established in accordance with the amount of time that has expired since an immediately preceding energization.

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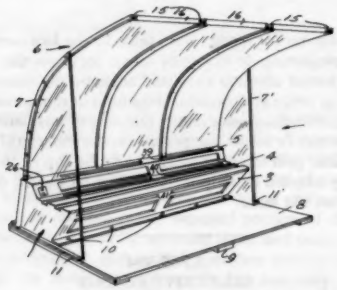
**3,745,305**

**PERSONNEL SHELTER**

David S. Reed, 6390 Pea Ridge Road, Huntington, W. Va., and John E. Cottrill, Cedar Court, South Point, Ohio

Continuation-in-part of Ser. No. 80,449, Oct. 13, 1970, abandoned.
Filed Jan. 6, 1971, Ser. No. 104,449
Int. Cl. H05b *1/00*
U.S. Cl. 219—217 8 Claims



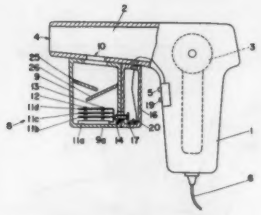
A personnel shelter is defined by a canopy and end walls of transparent lightweight flexible material which are removably attached to a bench. Heating and cooling, and air circulating devices are incorporated with the personnel shelter for conditioning the air within the shelter.

**3,745,306**

**STEAM GENERATING INSTRUMENT FOR HAIR-DRESSING**

Yasumitsu Naritomi, Izumi Suginami-ku, Tokyo, Japan, assignor to Shigeru Kawayama, Tokyo, Japan

Filed Apr. 7, 1971, Ser. No. 131,871
Int. Cl. F24h *3/00*
U.S. Cl. 219—272 5 Claims



Steam generating instrument for hair-dressing comprising a blower, steam generating means held integral with said blower, means for causing the blower to supply steam from said steam generating means into a venting duct, first switch for controlling said blower, and second switch for controlling said steam generating means.

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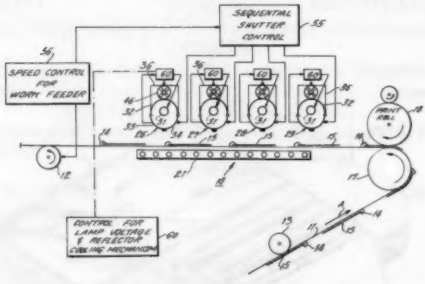
**3,745,307**

**APPARATUS FOR CURING SOLVENT-FREE PRINTING MATERIAL**

Sandford C. Peek, Jr., Oceanport, and Henry C. Newman, Scotch Plains, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed May 6, 1971, Ser. No. 140,752
Int. Cl. F27b *9/24*
U.S. Cl. 263—8 R 10 Claims

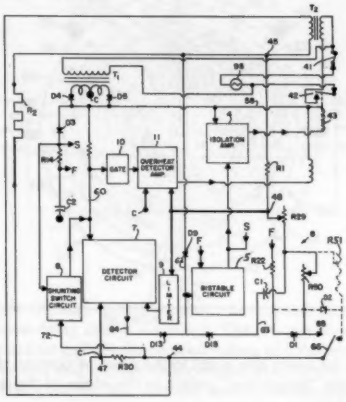



Printing apparatus utilizing lamps generating ultraviolet light to cure solvent-free ink by photopolymerization is provided with lamp reflectors having shutters to permit the lamps to remain energized while the printed work conveyor is stopped or is moving at a slow rate. A plurality of such lamps, each with an individual shutter, are arranged in parallel rows extending transverse to direction of movement of the work. The number of reflectors having open shutters is automatically coordinated with work conveyor speed, with an increase in conveyor speed being accompanied by an increase in the number of reflectors having open shutters. As each shutter is closed, the lamp voltage is reduced to a standby point where the lamp remains fired and at the same time increased air circulation is provided for cooling of the associated reflector. A liquid cooled plate is positioned behind the work feed path to shield other elements of the apparatus from lamp radiation.

## 3,745,308
## TEMPERATURE CONTROL CIRCUITS

Peter Lefferts, Hopewell, N.J., assignor to Heinemann Electric Company, Trenton, N.J.

Filed July 1, 1971, Ser. No. 158,895
Int. Cl. H05b 1/02
U.S. Cl. 219—499 20 Claims

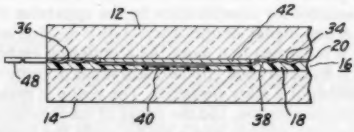



A system for applying electrical power to a heater element in response to a manual command, periodically monitoring changes in the temperature of the heater element by sensing its resistance during the heating process, and automatically disconnecting power from the heater when it reaches a preselected temperature. The system includes control circuits comprising an electrical bridge, including the heater element itself as one arm thereof, a comparator circuit for periodically sensing the output of the bridge at a time when the bridge is fully energized. The comparator generates a comparator signal each positive half cycle of the power source dependent upon the temperature of the heater element. A relay controls power to the bridge in response to a control signal generated by a bistable circuit. The bistable circuit is initially switched "on" in response to a manual command which results in power being applied to the bridge. Subsequently, the bistable circuit is switched "off" by each positive half cycle of power applied to the bridge circuit and "on" by the comparator signal at the end of each positive half cycle of power to the bridge circuit, so long as the temperature of the heater is below the preselected value. Each time the bistable circuit is switched "on," a half wave of power is applied to the relay to maintain it in an energized condition. When the temperature of the heater reaches the predetermined value, the comparator signal ceases to switch the bistable circuit "on" and power is disconnected from the bridge and the heater.

## 3,745,309
## ELECTRICALLY HEATED TRANSPARENT PANEL

George A. Gruss, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1972, Ser. No. 302,501
Int. Cl. H05b 3/06
U.S. Cl. 219—522 4 Claims




An electrically heated transparent panel is described for a laminated safety glass window construction having a clear polymer inner layer with a pattern of wrinkled resistance wires oriented in a three-dimensional non-parallel random fashion so as to reduce glare from the wires when the window is used in automative and other type vehicles. The individual resistance wires are partially embedded in the polymer sheet by a technique utilizing shrinkage of a thermoplastic polymer from its original dimensions when heated to an elevated temperature together with having the individual wires change configuration when relaxed from tension forces on the wire when first assembled with the polymer sheet. An improved form of bus-bar electrode means are connected at each end of the individual resistance wires by heat-bonding directly to the thermoplastic polymer sheet to provide the composite panel which can thereafter be handled and assembled by conventional further heat-bonding as the inner layer of a laminated safety glass construction.

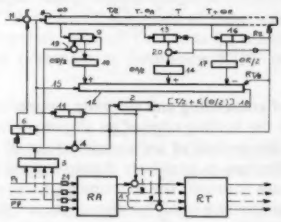
## ERRATA

For Classes 219—101 thru 219—137 see:
Patents Nos. 3,745,319 thru 3,745,322

## 3,745,310
## MAGNETIC TAPE READ-OUT SYSTEM

Pierre G. Laborde, 75 Paris, France, assignor to Compagnie Internationale Pour L'Informatique, Louveciennes, France

Filed Mar. 16, 1971, Ser. No. 124,871
Claims priority, application France, Apr. 8, 1970, 7012674
Int. Cl. G06k 7/08; G06f 11/02; G11b 5/58; G06k 7/14
U.S. Cl. 235—16.11 D 10 Claims

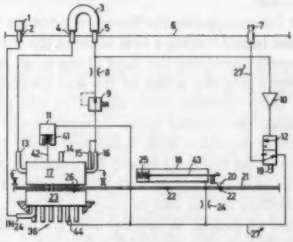



Chronometric controls are provided for detecting the occurrence of predetermined conditions of appearances of significant pulses in any character read out from the magnetic tape and for so modifying therefrom the length of the assembly operation of each read out character that the effect of the dynamic skew is substantially compensated in such assemblies.

## 3,745,311
## PNEUMATIC PROGRAM CONTROL SYSTEM

Sven Peter Jonas Westerberg, Saltsjo-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 6, 1971, Ser. No. 169,649
Claims priority, application Sweden, Aug. 25, 1970, 11523
Int. Cl. F15b 21/02; G05d 16/00; G06k 7/02
U.S. Cl. 235—61.11 J 15 Claims



A pneumatic program control system having reading blocks for reading a perforated card or tape in which system a group

of reading elements in the reading blocks are used each time a reading is performed for a programmed reading of the working condition of the controlled set-up as represented by the condition of detecting valves.

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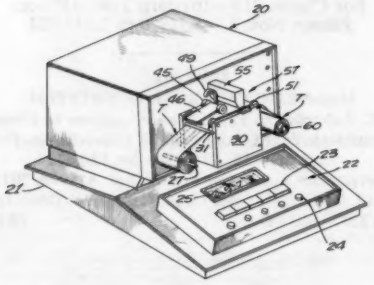
**3,745,312**
**PUNCHED TAPE READER, AND METHOD OF OPERATION**

**Duane A. Ladine, Northridge, and Lester E. McCullough, Glendale, both of Calif., assignors to Enviro-Labs, Inc., Glendale, Calif.**

**Filed May 24, 1971, Ser. No. 146,092**
**Int. Cl. G06k** *7/015*; **G03b** *1/24*
**U.S. Cl. 235—61.11 R** **4 Claims**




A method of controlling and stopping a punched tape to be read, in which the leading edge of an alignment hole is sensed as indicating the arrival of an associated set of information holes. Then the tape is positively driven several small incremental distances forward, the increments being chosen such that each increment is a small fraction of the width of an information hole, and the several increments together are equal to less than the width of an information hole. Then the tape is stopped and the set of information holes is read. The tape reader apparatus for carrying out the method includes sensing means to detect arrival of the leading edge of an alignment hole, a stepper motor to drive the tape, a pulse source, and gating means for supplying a selected number of pulses to the motor after the arrival of the alignment hole has been detected.

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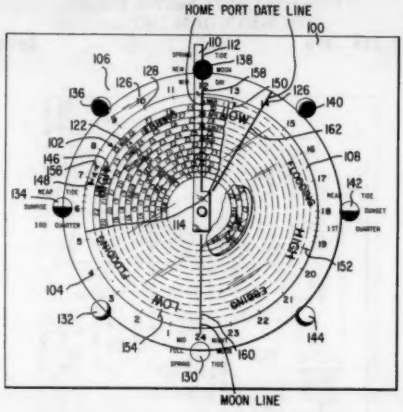
**3,745,313**
**TIDE COMPUTATION APPARATUS AND METHOD OF USING THE SAME**

**Athelstan F. Spilhaus, Washington, D.C., assignor to Nautilus Press, Inc., Washington, D.C.**

**Filed June 13, 1972, Ser. No. 262,301**
**Int. Cl. G06c** *3/00*
**U.S. Cl. 235—88** **13 Claims**

Apparatus for computing the times of tides for a given date includes a base board having a first scale in the form of a spiral with index marks signifying the days of the year. A second circular scale signifying the hours of the day surrounds the first scale, and a third circular scale signifying the phases of the moon surrounds the second scale. A transparent cover plate or disc, which is provided with index marks for high and low tide, is mounted on the base board for rotation over the first scale about an axis concentric with the spiral and the circular scales. The surface of the disc is roughened so that it may be readily marked by pencil. A marker arm is mounted for rotation on the axis over the cover disc and has a straight edge which extends radially from the axis. A method is described involving the employment of tide tables and astronomical daily calendars of moon phases for scribing a "home port date line" and a "moon line" on the cover disc. When the "home port date line" is set over a given date on the first scale, index




marks on the cover disc point to the times of tides on the given date and the "moon line" points to the phase of the moon for the given date.

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**3,745,314**
**CAVITY IDENTIFICATION**

**Benny B. Mathias, Maumee, and James R. Sager, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio**

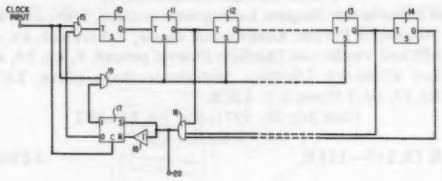
**Filed June 18, 1971, Ser. No. 154,473**
**Int. Cl. G06k** *7/12*; **G01n** *21/32*; **C03b** *9/32*; **G06m** *7/04*; **B07c** *5/342*
**U.S. Cl. 235—61.11 E** **10 Claims**

Apparatus and method for determining which of a plurality of molds produced a particular bottle and a bottle coded in a manner suitable for identification by the apparatus of the invention. A non-digital identification code is molded into a bottle while it is formed in a mold. As a preferred embodiment, the code is an octal code imposed as a series of protuberances in the bottom of a glass container. The bottle is presented at an identification station, and the image of the identification indicia is optically rotated past a reader while the bottle is held stationary. By use of suitable logic and read-out electronics, the mold number of a bottle may be displayed as a digital number and all bottles from a selected mold may be rejected.

## 3,745,315
## RIPPLE-THROUGH COUNTERS HAVING MINIMUM OUTPUT PROPAGATION DELAY TIMES

Henry T. Brendzel, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 861,433, Sept. 26, 1969, Pat. No. 3,613,088. This application Mar. 26, 1971, Ser. No. 128,548
Int. Cl. H03k 21/36
U.S. Cl. 235—92 LG 3 Claims

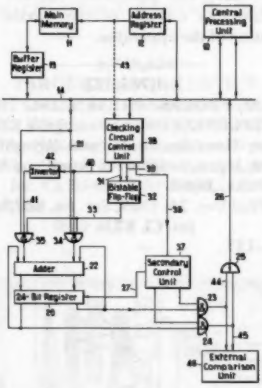


A ripple-through binary counter having minimum output propagation delay time is disclosed. The process for constructing the counter utilizes the desired values of loop length, clock frequency and single-stage delay time to specify the number of stages in the counter, the terminal state of the counter, and the logic gate configuration required to reset the counter from its terminal state to its initial state. A counter constructed in accordance with this process has a minimum propagation delay before producing an output.

## 3,745,316
## COMPUTER CHECKING SYSTEM

George Olah, London, England, assignor to Elliott Brothers (London) Limited, London, England

Filed Dec. 13, 1971, Ser. No. 207,017
Int. Cl. G06f 11/00
U.S. Cl. 235—153 A 5 Claims

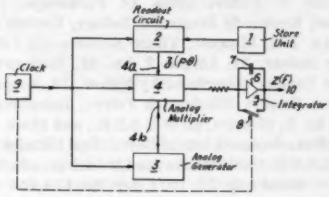



In a computer, a monitoring means for the detection of faults in operation comprises checksum forming means for forming concurrently with the performance of a program by the computer, a checksum of words read out from the computer memory in performance of the program, and means for comparing the checksum, at intervals, against predetermined values which the checksum should have at the times of comparison if the computer is operating correctly.

## 3,745,317
## SYSTEM FOR GENERATING THE FOURIER TRANSFORM OF A FUNCTION

Daniel Berthier, Grenoble; Jean-Marc Fauque, Gap, and Jacques Max, Saint-Egreve, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 841,702, July 5, 1969, abandoned. This application May 21, 1971, Ser. No. 145,689
Claims priority, application France, July 30, 1970, 70161135; May 26, 1970, 7019221
Int. Cl. G06f 7/38; G06g 7/19
U.S. Cl. 235—156 7 Claims

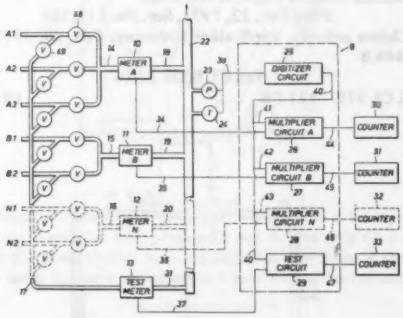



A system generates the Fourier transform of a real function $z(t)$ which is known in a time interval 2T and which is given in this interval in the form of N samples at equal time intervals $\Theta$, i.e., in the form $Z(p\Theta)$ in which $p$ is an integer such that $T/\Theta \leq p \leq T/\Theta$. The product $z(p\Theta) \times \cos \pi/T\ Kp\Theta$ or the product $z(p\Theta) \times \sin \pi/T\ K_p\Theta$ generated in the system is computed for values of the integer K increasing from 1 inclusive to $T/\Theta$ inclusive. The sum of these successive products, is computed; each of the sums represents a sampling point of the harmonic at frequency K/2T of the Fourier transform.

## 3,745,318
## DIGITAL MULTIPLYING CIRCUIT

Larry J. Stroman, Houston, Tex., assignor to Daniel Industries, Inc., Houston, Tex.

Division of Ser. No. 820,872, May 1, 1969, Pat. No. 3,588,481. This application June 24, 1971, Ser. No. 156,390
Int. Cl. G06f 7/39, 15/46
U.S. Cl. 235—156 29 Claims



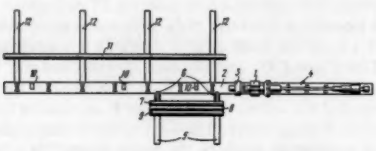

This application discloses a circuit for multiplying a known digital signal by a variable multiplying factor for use in correcting actual fluid volume measurements to a standard volume. In one exemplar embodiment, a digitizing circuit generates a discrete series of digital signals proportional to the variable multiplying factor, a digital pulse generator cooperating with the digitizing circuit generates at least a pair of time-spaced digital signals and a multiplying circuit receives the discrete series of digital signals and the pair of time-spaced digital signals and provides a product of the discrete series of digital signals and the known digital signal.

3,745,319

## APPARATUS FOR RESISTANCE BUTT WELDING OF SEVERAL PIPES INTO EXTENDED SECTIONS

Mikhail Rakhmilevich Unigovsky, ulitsa Pushkina, 21, kv. 33; Julian Konstantinovich Konovalov, ulitsa Saxaganskogo, 31, kv. 5a; Evgeny Vasilievich Rulevsky, ulitsa Vyshgorodskaya, 31, kv. 64; Petr Ivanovich Zakrevsky, ulitsa P. Mirnogo, 27, kv. 1; Veniamin Solomonovich Rotenfeld, ulitsa Vyshgorodskaya, 31, kv. 40; Anatoly Ivanovich Chvertko, Bulvar Lesi Ukrainki, 2, kv. 21; Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Tsezar Bronislavovich Golenzovsky, ulitsa K. Marxa, 11, kv. 64; Georgy Vasilievich Gorbunov, Bulvar Lesi Ukrainki 2, kv. 41, all of Kiev; Vladimir Ivanovich Prokofiev, ulitsa 14 Parkovaya, 3, kv. 33, Moscow; Konkordy Ivanovich Zaitsev, Leninsky prospekt, 62/1, kv. 172, Moscow; Viktor Senderovich Lifshits, Kavkazaky bulvar, 21, korpus 2. kv. 41, Moscow; Oleg Sergeevich Papkov, Smarkandsky bulvar, 24, korpus 3, kv. 3, Moscow; Georgy Nikolaevich Petrov, Izmailovsky bulvar, 34/32, kv. 8, Moscow, all of U.S.S.R., and Mark Davidovich Litvinchuk, deceased, late of Bulvar Lesi Ukrainki, 2, kv. 21, Kiev, U.S.S.R. (Sofia Isaakovna Litvinchuk, administrix)

Filed Aug. 25, 1971, Ser. No. 174,764
Int. Cl. B23k 9/02
U.S. Cl. 219—101 3 Claims



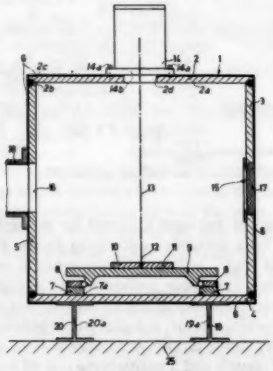
An apparatus for resistance butt welding of several pipes into extended pipe lengths. The apparatus uses a conveyor-type transport device for feeding the pipes to a butt-welding machine, trimmers for the removal of external and internal weld burrs, and skids for delivering single pipes to the transport device.

3,745,320

## ELECTRON-BEAM CHAMBER

Siegfried Baumgartner, Sixtnitgern, and Hubert Kindler, Munich, both of Germany, assignors to Steigerwald-Strahltechnik GmbH, Munich, Germany

Filed Feb. 22, 1971, Ser. No. 117,329
Claims priority, application Germany, Feb. 28, 1970, P 20 09 448.8
Int. Cl. B23k 15/00
U.S. Cl. 219—121 EB 10 Claims



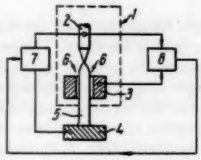
A vacuum chamber for the electron-beam welding of workpieces disposed within an evacuated space is provided with means, consisting either of the symmetry arrangement of the chamber or a fixed mounting of the electron gun and workpiece support, to prevent displacement of the point at which the beam impinges upon the workpiece and the angle of incidence of this beam as the walls of the evacuated space deform under stresses arising from evacuation.

3,745,321

## METHOD OF CONTROL OVER OPERATING CONDITIONS OF AN APPARATUS FOR PLASMA-ARC TREATMENT OF ARTICLES AND AN APPARATUS FOR PLASMA-ARC TREATMENT

Ilya Samoilovich Shapiro, Leningradskoe shose, I, kv. 240; Lev Moiseevich Persits, Korovinskoe shosse, 7, korpus I, kv. 24; Mikhail Vasilievich Tkachev, Putevoi proezd, 8, kv. 59, and Lev Efimovich Linetsky, Metrastroevskaya ulitsa, 13/12, Kv.13, all of Moscow, U.S.S.R.

Filed July 28, 1971, Ser. No. 166,692
Int. Cl. B23b 1/06
U.S. Cl. 219—121 P 3 Claims



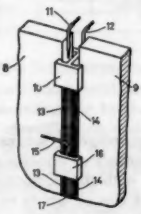
An apparatus for treating an article or workpiece by plasma arc has a plasmatron, a cathode from which a plasma arc is struck to the workpiece through a conductive nozzle and a controlled current supply source having a control circuit and connected between the cathode and the workpiece. A voltage-sensitive element is also connected between the cathode and nozzle. The voltage-sensitive element is essentially a filter adapted to pass frequencies exceeding the ripple frequency of the plasma-arc supply source, and a threshold element. During a voltage jump between the cathode and the article the threshold element generates a pulse which is supplied to the control circuit of the plasma-arc supply source, thus causing discontinuation of the supply current increase and, consequently, obviating the plasma-arc current increase. This prevents undesirable erosion of the nozzle and causes a smooth operation of the apparatus.

3,745,322

## WELDING PROCESS PREVENTING THE BOND BRITTLENESS OF LOW-ALLOY STEELS

Yoshimori Ito; Masahiko Ikeda, and Kiyoshi Bessyo, all of Nishinomiya, Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed Dec. 24, 1969, Ser. No. 887,885
Int. Cl. B23k 9/00
U.S. Cl. 219—137 4 Claims



This invention is to establish a new welding process for welding a high strength steel, low-temperature service steel or

low-alloy steel by first depositing a high notch toughness metal on each root face of a joint, then welding the deposited high notch toughness metal layers and heat-treating the weld bond with the welding heat to prevent weld bond brittleness.

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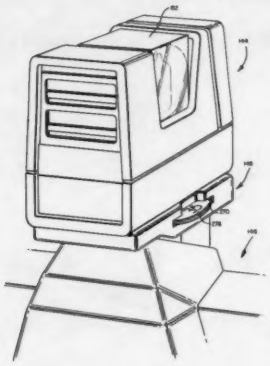
**3,745,323**
**ADAPTOR FOR VARIABLE OUTPUT PHOTOFLASH APPARATUS**

**John B. Morse, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed May 6, 1971, Ser. No. 140,890**
**Int. Cl. G03b *15/03***
**U.S. Cl. 240—1.3** **18 Claims**



A variable output photoflash unit structured to be installed on and mechanically coupled to a particular line of commercial photographic cameras for automatic "follow-focus" control of its output, and an adaptor for adapting the photoflash unit for use with any camera having flash capability. The photoflash unit receives a multi-lamp photoflash assembly of the "flash cube" type and has adjustable attenuating means effective to attenuate a variable fraction of the luminous energy produced by the flash lamps in the assembly dependent upon the input received by a sensing probe. The adaptor accommodates the sensing probe and provides for manual selection of different levels of light output from the flash unit according to and in terms of the range of objects to be photographed.

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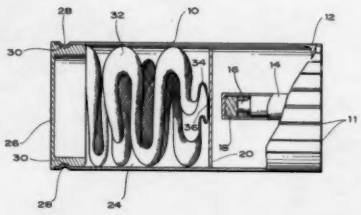
**3,745,324**
**TARGET MARKING DEVICE**

**Sydney Shefler, China Lake, and Harold S. Duff, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed June 4, 1971, Ser. No. 152,462**
**Int. Cl. B64d *17/00*; F42b *13/38***
**U.S. Cl. 240—2.25** **3 Claims**

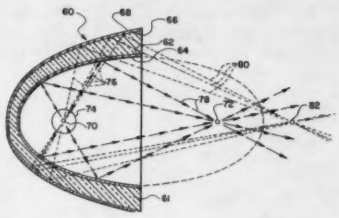


A target marking device comprising a parachute or panel soaked in a chemiluminescent agent sealed inside a canister which upon rupture releases the canopy which falls to the target location where the agent reacts with oxygen in the air forming a glow visible from all quadrants, particularly at night.

**3,745,325**
**PHOTOGRAPHIC LIGHT**

**Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 17, 1971, Ser. No. 172,457**
**Int. Cl. G03b *15/02*; F21v *7/00***
**U.S. Cl. 240—1.3** **2 Claims**



A photographic light has a light source and a reflector. The reflector has a pair of surfaces, the innermost of which is elliptical in cross-section and is coated with a material which is transparent to infrared radiation but reflective of visible radiation. The outermost surface is roughened and coated with a material which is reflective of both visible and infrared radiation.

In another embodiment, the outermost surface of the reflector is elliptical in cross-section but has a different focal point than the innermost surface and is coated with a reflective material.

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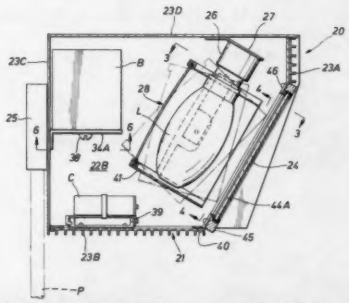
**3,745,326**
**FLOODLIGHT**

**Jose A. Hernandez, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.**

**Continuation of Ser. No. 26,710, April 8, 1970, abandoned.**
**This application June 14, 1972, Ser. No. 262,501**
**Int. Cl. F21p *5/00***
**U.S. Cl. 240—3** **6 Claims**



A floodlight having a reflector mounted in a housing for swinging about an axis perpendicular to the axis of a lamp within the housing and between different positions on the side of the lamp opposite a window in a side wall of the housing.

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**3,745,327**
**LIGHTING UNIT ARRANGEMENTS FOR NEEDED AND/OR DECORATIVE LIGHTING USING DEFINITE FORMS SUCH AS LIGHT BLOCKS**

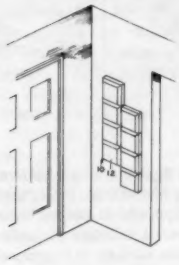
**Dennis J. Lowery, and Robert E. Merchant, both of Grand Junction, Colo., assignors to Dixson, Inc., Grand Junction, Colo.**

**Filed Mar. 23, 1972, Ser. No. 237,383**
**Int. Cl. F21v *21/00*; F21p *1/02*; F21s *1/02***
**U.S. Cl. 240—9 R** **6 Claims**

For needed and/or decorative lighting in homes, offices, clubs and other dwellings, lighting units, such as light block

units, usable as a single unit and in groups, create white and/or colored artificial light. They may be arranged, one adjacent another, as walls of light, decorative strips of light, room dividers of light, accent groups of light, and walls designs of light.

Each light block unit has: at least one light source, comprising an electric light bulb, socket, and wires; a reflector caseback, which receives screw and/or adjesive fasteners to secure it to a building structure, which holds a light socket, to guide wires through the light block unit and on to adjacent light blocks, while the wires remain concealed throughout an



overall arrangement of light block units, and which abuts adjacent casebacks at one or more preselected locations for the correct overall spacing of several light block units without requiring measurements beyond selecting the location of the first light block unit to be installed; a casefront or cover to conceal the caseback and its electrical attachments while providing an overall light passing cover, which is preferably snapped on and off providing ready access to the bulb, which may be white or colored. Several light block units, up to a presently recommended limit of thirty-six may be connected to the same lead-in electrical circuit, which inturn may incorporate several plugs and switches.

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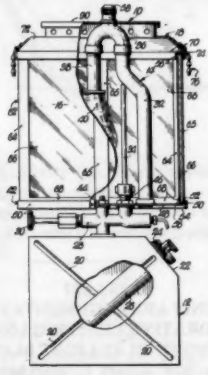
**3,745,328**
**COLLAPSIBLE LANTERN**
**Coler S. Hissem, 211 E. First St., and Alfred James, III, 909 Bittin Bldg., both of Wichita, Kans.**
**Filed Mar. 22, 1972, Ser. No. 237,097**
**Int. Cl. F21r *33/00***
**U.S. Cl. 240—11** **1 Claim**



A collapsible lantern has a hollow lens unit which receives and houses a fuel tank when the unit is removed from a normal surrounding relationship to a burner assembly mounted on and in communication with the tank. The unit is secured by a releasable structure that includes a pair of opposed sockets, one of which faces upwardly to receive the lens unit when the lantern is normally assembled. A second, downwardly facing socket receives the lens unit when the tank has been received and housed by the unit. As compared to its normally assembled state, the lantern is thus appreciable reduced in height for storage purposes. A top member of the lantern is adapted to also serve as the cover for a storage container for the lantern when the tank is housed within the unit. The container is also adapted to be utilized as a cooking utensil for use with the lantern when the same is normally assembled.

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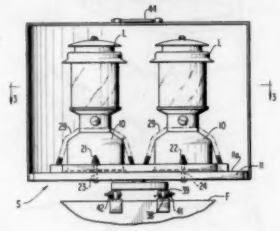
**3,745,329**
**LANTERN HOLDER**
**George P. Runey, Jr., 1485 Hindman Avenue, Mt. Pleasant, S.C.**
**Filed Nov. 30, 1971, Ser. No. 203,169**
**Int. Cl. F21v *21/08***
**U.S. Cl. 240—52.1** **1 Claim**



A support for a pair of lanterns of the Coleman type comprising a base provided on its upper surface with a clamping device for clamping the lantern in an upright position, the base being rotatably mounted on a sub-base in turn mounted for tilting movement on a c-clamp for clamping the support to an associated supporting member such as a boat gunwhale, wall or the like with a reflector mounted on the base for directing the light from the lantern in one direction.

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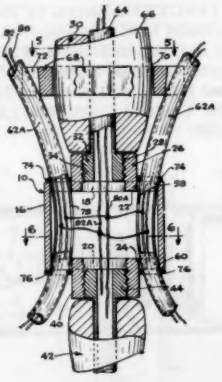
**3,745,330**
**LIGHT FIXTURE**
**Carl A. Frost, 721 Duane, Glen Ellyn, Ill.**
**Filed Nov. 18, 1971, Ser. No. 199,905**
**Int. Cl. F21s *1/06***
**U.S. Cl. 240—78 F** **8 Claims**



A light fixture with hollow chandelier arms which support an electrical light source and are rotatably mounted on a wire splice housing. The chandelier arms form conduits for electrical wires to the light sources, and may be rotated with respect to the housing to fold into a smaller volume for shipment or

the like without breaking the electrical connections to the light sources. The light fixture may be suspended on a chain or mounted in a floor stand, or incorporated in a pole for support of a tent or the like.

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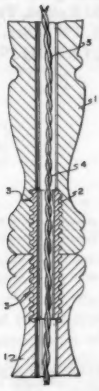
**3,745,331**
**LAMP STAND CONNECTOR**
**Edward F. Dennis, 362 Merry St. South, Magog, Quebec, Canada**
**Filed July 23, 1971, Ser. No. 165,493**
**Int. Cl. F21s *1/12, 3/10***
**U.S. Cl. 240—81 BS** **12 Claims**



The present invention provides connectors for forming a joint in the recessed abutting ends of adjacent members, such as wood turnings, in the stand of an electric lamp stand, the end portions of the connector being releasably fixedly accommodated in the recesses and both the members and the connectors including a bore to provide for passage of electric flex to a socket to provide power for lighting the bulb of a lamp formed from said stand. The recesses are preferably internally threaded and the connector is preferably externally threaded to provide for the releaseable fixed accommodation of the connector in the recesses.

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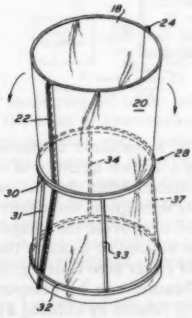
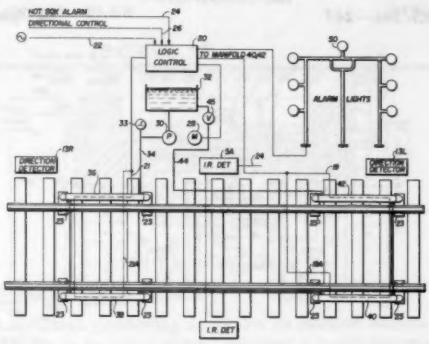
**3,745,332**
**LAMP SHADE**
**Alfred L. Weisbrod, 1214 Valley Road, Villanova, Pa.**
**Filed Apr. 16, 1971, Ser. No. 154,569**
**Int. Cl. F21v *1/14***
**U.S. Cl. 240—108 R** **3 Claims**



A lamp shade has fabric on the inside and outside but only uses two pieces of fabric instead of the conventional construction having four pieces of fabric. Lamp shades made in this manner have substantial savings in labor, pattern setting, and sewing of seams.

**3,745,333**
**HOT BOX LOCATERS WITH CIRCULATING FLUID SYSTEM**
**Benjamin F. McLean, 2303 Caplhart Road, Richmond, Va.**
**Filed Mar. 9, 1971, Ser. No. 122,364**
**Int. Cl. B61l *3/06*; B61k *9/06***
**U.S. Cl. 246—169 D** **2 Claims**




There is disclosed a hot box locator for identifying and locating overheated journal bearings, which circulates a special marking fluid for spraying on train wheels when a defect is detected. The defective overheated journal bearings are detected by an infrared sensing device. Control means are used to activate specially designed electromagnetic pin valves which spray the vehicle wheels with a temporary marking substance when a hot box is indicated. The pin valve construction and circulating marking fluid causes the equipment to operate even after long periods of inactivity. The present invention is directed to hot box locator systems which detect and mark overheated journale bearings of railroad vehicles.

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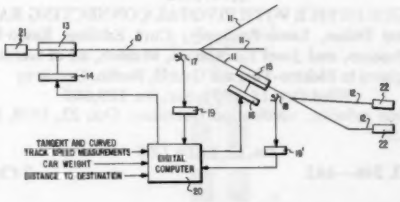
**3,745,334**
**HUMP YARD RETARDER CONTROL SYSTEM**
**Peter J. Wong, Menlo Park, and Robert S. Ratner, Los Altos, both of Calif., assignors to Southern Pacific Transportation Company, San Francisco, Calif.**
**Filed Sept. 23, 1971, Ser. No. 183,029**
**Int. Cl. B61k *7/12***
**U.S. Cl. 246—182 A** **6 Claims**

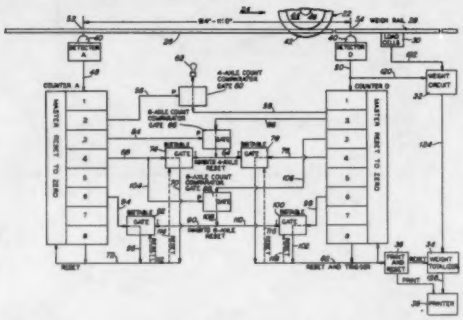



A system utilizing an algorithm and associated digital computer program for controlling a hump yard retarder to release freight cars from the retarder with a predetermined exit speed. The algorithm accepts successive measurements of car velocity during the time the car is in the retarder, and a specification of the desired retarder exit speed, and computes digitally an effective sequence of retarder operating commands, to smoothly decelerate the car to the desired final speed. Feedback through successive speed measurements is employed to ensure accurate exit speed control over a broad range of car weights and rollabilities. The deceleration is smoothed over the length of the retarder to avoid excessive wear on the leading end of it. The algorithm ensures that the retarder will be open at car release if the final speed has been reached.

## 3,745,335
## METHOD AND APPARATUS FOR GENERATING A READ-OUT SIGNAL SYNCHRONIZED WITH RAILWAY VEHICLE MOVEMENT

Lawrence A. Tonies, Grayslake, Ill., assignor to Mangood Corporation, Grayslake, Ill.

Filed Feb. 27, 1970, Ser. No. 15,066
Int. Cl. B61l *1/16*
U.S. Cl. 246—247 12 Claims

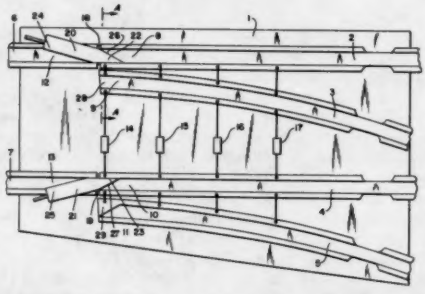


A system for generating a read-out signal which is synchronized with movement of a specific car portion such as a selected axle of each vehicle in a train past a selected location, for a mixed train of standard four-, six- and eight-axle railway cars and engines while coupled and in motion. The "-selected location" has initial and final axle detectors spaced no less than 9 feet 4 inches and no more than 11 feet apart along the railroad track, for railway vehicles having axle spacings according to standard American practice. The detector spacings will differ for other axle spacings. Each detector has a counter for counting the number of axles on each vehicle and re-setting to zero after actuation by the last axle. The "-selected axle" may be the last one on the vehicle where the read-out signal is used for triggering weight print-out of the vehicle. For any other information about the vehicle such as car style, type of load, shape, color, identification number, etc., the read-out signal may be generated when the counters are programmed for reset; or when the initial counter resets; or when the final counter resets; or in response to any other unique condition of the counters which occurs only once each time a vehicle moves past the axle detectors.

## 3,745,336
## TONGUE DEVICE WITH PIVOTAL CONNECTING RAILS

Ruthard Dohse, Essen-Bredeney; Curt Edeling, Essen-Reilinghausen, and Josef Eisenmann, Munich, all of Germany, assignors to Elektro-Thermit GmbH, Berlin, Germany

Filed Oct. 15, 1971, Ser. No. 189,605
Claims priority, application Germany, Oct. 22, 1970, P 20 51 882.5
Int. Cl. E01b *7/00*
U.S. Cl. 246—442 7 Claims

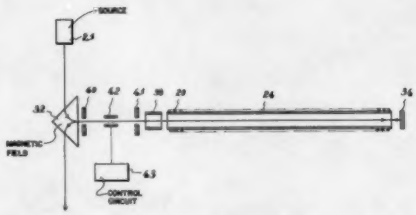


This invention relates to a tongue device with pivotal connecting rails for switch points which can be negotiated at high speeds free from vibrations and jolts in the branching track comprising base means, connecting rails of a main track and a branching-off track hingedly connected with each other and pivotally mounted on said base, means for pivoting said connecting rails, and wedge means adapted to be inserted in corresponding recesses in mutually adjoining tracks for closing the gaps in the two extensions of the inner rail edges.

## 3,745,337
## APPARATUS FOR SEPARATING CHARGED PARTICLES ACCORDING TO THEIR RESPECTIVE RANGES

Hirotami Koike, Nishitama-gun, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1971, Ser. No. 142,465
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 TF 3 Claims

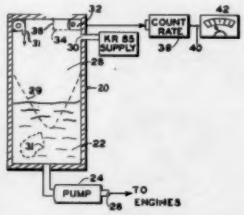


An apparatus for separating charged particles according to their respective energies. The charged particles are decelerated and passed through a long cylindrical electrode having a focusing coil. Since the velocity of the particles differs according to their respective energies, the particles are separated in the electrode and exit the electrode at different times.

## 3,745,338
## VOLUMETRIC MEASURING METHOD AND APPARATUS

William B. Joyce, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Aug. 17, 1964, Ser. No. 390,002
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 FL 43 Claims

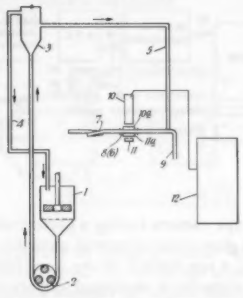


Ullage volume of a container containing a fluid is determined by injecting a known quantity of radioactive material into the ullage volume. After the radioactive material has dispersed uniformly throughout the ullage volume the density thereof is measured to provide the ullage volume indication. The system can be utilized to monitor the amount of fuel in the container under either zero G or a gravitational field. The ullage volume indication can be compensated for pressure variations within the volume by utilizing a pressure transducer having an output that is combined with the detected density. A system is provided to compensate for background, radiation noise. The system can also be utilized to detect leakage from the container by noting changes in concentration of the radioactive material. Corrections for temperature variations are also provided. In fixed volumes systems, the device can be utilized to monitor pressure and temperature variations.

## 3,745,339
## PARTICLE SIZE ANALYSIS

Peter Edward Starnes, Earley, Reading, Berkshire, England, assignor to Cartner Group Limited, Middlesex, England

Filed July 1, 1970, Ser. No. 51,503
Claims priority, application Great Britain, July 1, 1969, 33265/69
Int. Cl. G01n 23/12
U.S. Cl. 250—43.5 D 8 Claims

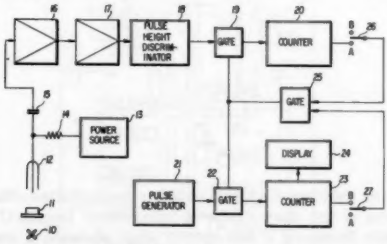


In the carrying out of fineness measurements upon a flowing suspension of solids in a liquid by the application of a force field, the flow of the suspension through the apparatus is under a constant head and two or more radiation absorption measurements upon the suspension are made at least one of which is made subsequent to the application of the force field. From these measurements the fineness of the solids present is deduced, being expressed in terms of the proportion by weight coarser than a given standard sieve mesh.

## 3,745,340
## APPARATUS FOR MEASURING THE SULFUR CONTENT OF HYDROCARBONS

Yuichiro Inoue, Mitaka-shi, Tokyo-to; Masamichi Sakaki, Minamitame-gun, Tokyo-to, and Teruo Fukabori, Kawasaki-shi, Kanagawa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 30, 1971, Ser. No. 203,354
Int. Cl. G01n 23/12
U.S. Cl. 250—43.5 MR 6 Claims



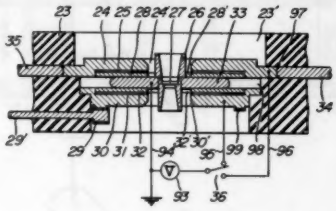

An apparatus for measuring the sulfur content of hydrocarbons by detecting the dose of gamma-rays which penetrate through a hydrocarbon whose sulfur content is to be determined. A first counting means is provided for counting the dose of gamma-rays which penetrates through the hydrocarbon whose sulfur content is to be measured, a second counting means for counting the number of pulses which have a constant period which are generated from a pulse generator and a display means which directly displays the sulfur content of the hydrocarbon.

The first counting means and the second counting means both begin to count simultaneously and both stop simultaneously when the value counted by the first counting means reaches a preset value which is required to display the sulfur content of the hydrocarbon to be measured with n decimal figures of accuracy. The sulfur content is provided by the count in the second counter and is displayed by the display means to thereby enable the sulfur content to be directly read.

## 3,745,341
## SPECIMEN POSITIONING DEVICE FOR ELECTRON MICROSCOPE AND THE LIKE

Yoshio Sakitani, Katsuta-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 24, 1972, Ser. No. 283,294
Claims priority, application Japan, Aug. 25, 1971, 46/64441
Int. Cl. H01j 37/20
U.S. Cl. 250—49.5 B 3 Claims

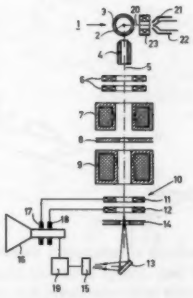


A specimen positioning device for an electron microscope or the like is provided which comprises a rectilinear motion mechanism and a rotating mechanism. A movable member in the rectilinear motion mechanism and a rotary member in the rotating mechanism are selectively coupled under the Coulomb force to a driven member which carries a specimen holder, so that the rectilinear or rotary motion may be transmitted to a specimen.

## 3,745,342
## ELECTRON BEAM APPARATUS COMPRISING A CATHODE TO BE HEATED BY AN ENERGY BEAM

Jan Bart Le Poole, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1971, Ser. No. 203,708
Claims priority, application Netherlands, Dec. 23, 1970, 7018701
Int. Cl. H01j 37/26; G01n 23/00
U.S. Cl. 250—49.5 A 14 Claims

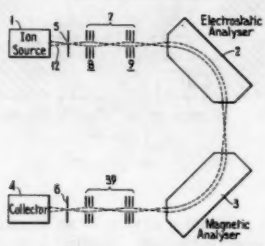


An electron source comprising a cathode in the form of a metal wire placed under tension and heated by an energy beam. The energy beam laterally impinges upon the metal wire which has a lateral emitting surface. The metal wire can be displaced along the location where the energy beam impinges without a slackening of the wire. This movement can be automatically controlled in response to the temperature of the metal wire.

## 3,745,343
## ION LENS SYSTEM FOR MASS SPECTROMETERS AND METHOD OF OPERATION

John S. Halliday, and Sydney Evans, both of Sale, England, assignors to Associated Electrical Industries Limited, London, England

Filed Nov. 4, 1970, Ser. No. 87,020
Claims priority, application Great Britain, Nov. 7, 1969, 54646/69
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 ME 20 Claims

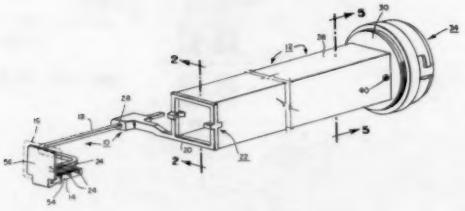



An ion lens system which may be utilized with a mass spectrometer for varying the width of an ion beam entering or leaving the analysis region of the spectrometer, and method of operation thereof. The lens system includes a plurality of apertured ion lenses which may be positioned between an ionization chamber and the analysis region of the spectrometer, or alternatively, may be positioned between the analysis region of the spectrometer and the collector. By varying the potentials applied to the ion lenses, the effective widths of the apertures may be altered in order to vary the width of the ion beam.

## 3,745,344
## INTRADRAL RADIOGRAPHIC SYSTEM FOR SUBSTANTIALLY CONFINING THE X-RAY BEAM TO THE FILM

William J. Updegrave, 616 W. Harrter St., Philadelphia, Pa.

Filed Dec. 20, 1971, Ser. No. 209,827
Int. Cl. G21f *5/04*; H01j *35/16*
U.S. Cl. 250—70 11 Claims

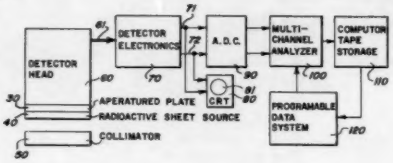


An x-ray beam of rectangular cross-section is produced at the end of a lead-lined rectangular collimating tube. The rectangular tube is aligned with a dental film-holding instrument comprising a bite block, a directing rod attached to the bite block, and a rectangular guide member attached to the directing rod. The alignment is achieved by keying the rectangular guide member to the end of the rectangular collimating tube.

## 3,745,345
## RADIATION IMAGING DEVICE

Gerd Muehllehner, Mount Prospect, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Nov. 9, 1971, Ser. No. 196,891
Int. Cl. G01j *39/18*
U.S. Cl. 250—71.55 5 Claims

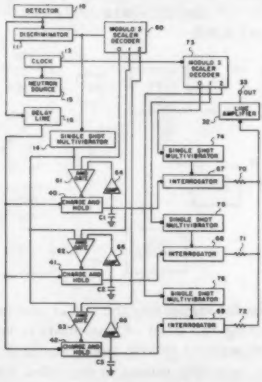



An Anger-type camera having a photomultiplier tube array mounted on a glass cover of crystal assembly to be about one-half inch from a top surface of the scintillation crystal. Nonlinear spatial response is measured at points on crystal defining an array to determine correction factors at measurement points. Correction factors are stored and employed to correct output signals from the camera either on a one-event-at-a-time basis or after an uncorrected map has been stored in core memory in a digital data system.

## 3,745,346
## CIRCUIT FOR REDUCING PULSE PILE-UP IN PULSE DIRECTION SYSTEMS BY CONVERTING A RANDOM PULSE TRAIN TO THAT OF FIXED FREQUENCY

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 1, 1971, Ser. No. 148,754
Int. Cl. G01t *3/00*
U.S. Cl. 250—83.3 R 6 Claims

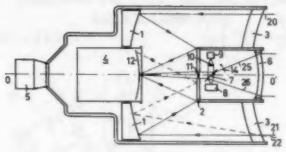



The amplified pulses from a radioactivity detector are coupled to a discriminator and via a 400 nanosecond delay line to the inputs of three charge and hold circuits. The discriminator drives a first modulo 3 scaler-decoder and also a single shot multivibrator. The single shot output and the decoder outputs are AND gated with a sense amplifier sensing the charge and hold capacitor to control the charge and hold circuits. A second modulo 3 scaler-decoder circuit driven by a clock provides the gating of three interrogator circuits connected to the outputs of the three charge and hold circuits, respectively. The circuit converts the random pulse train from the radioactivity detector to that of a train of pulses of a fixed frequency.

## 3,745,347
## TELESCOPE INCLUDING AN IMAGING SYSTEM FOR RADIATION IN THE VISIBLE RANGE

Heinrich deBrey, Eindhoven, and Pieter Roos, Emmasingel, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,429
Claims priority, application Netherlands, Dec. 3, 1970, 7017658
Int. Cl. G01j 5/02
U.S. Cl. 250—83.3 H 7 Claims

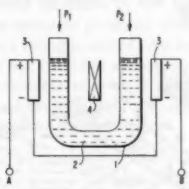


A telescope containing an imaging system for radiation in the visible range is described. The telescope is provided with a device which indicates whether an object having a temperature different from that of its surroundings is present in the central part of the field of view of the telescope. Thus, objects may be observed even at a dim scene illumination.

## 3,745,348
## ELECTRIC DIFFERENTIAL PRESSURE CONVERTER FOR THE CONTROL OF PROBES IN THE DIRECTION OF FLOW

Heinrich Kummeke, Dachau-Etzenhausen, Germany, assignor to Motoren-und Turbinen-Union Muchen GmbH, Munich, Germany

Filed Apr. 23, 1969, Ser. No. 818,532
Claims priority, application Germany, Apr. 26, 1968, P 17 73 290.0
Int. Cl. G01n 21/26
U.S. Cl. 250—218 6 Claims



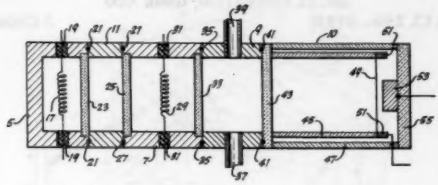
A differential pressure converter which includes an essentially U-shaped manometer of which each leg is arranged between a common light source and a photocell while an opaque fluid is used in the manometer.

## 3,745,349
## SINGLE PATH, DUAL SOURCE RADIANT ENERGY ANALYZER

Max David Liston, 4121 Seton Road, Irvine, Calif.

Filed Nov. 18, 1971, Ser. No. 199,889
Int. Cl. G01n 21/26
U.S. Cl. 250—218 10 Claims

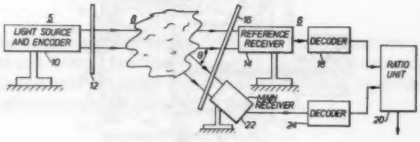
There is disclosed a radiant energy analyzer having a primary and secondary source of radiant energy which energy traverses a partially coincident path to a radiant energy detector. The primary source issues a radiant energy spectrum which is coincident at least in part with the absorption spectrum of a substance being analyzed. The secondary source generates a reference spectrum of radiant energy to which the spectrum from the primary source is compared in the radiant energy detector. The sources are alternately activated to provide a sample or measurement condition and a reference condition for analysis. The primary source is always directed through a container which confines the substance being analyzed and finally to the detector. The secondary source may be interposed between the container and the primary source, between the container and the detector or optically combined in parallel with the primary source depending upon the secondary source's spectrum of radiation and the analyzer application. A feedback loop is provided from the detector to at least one of the sources to control the radiant energy therefrom whereby the measurement and reference conditions are maintained balanced.



## 3,745,350
## APPARATUS RESPONSIVE TO RADIATION ATTENUATION OF AN ATMOSPHERE

Edwin T. Hill, Cowes, and John Harvey Quick, East Cowes, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed May 3, 1971, Ser. No. 139,712
Claims priority, application Great Britain, May 2, 1970, 21,188/70; June 13, 1970, 28,731/70
Int. Cl. G01n 21/00, 21/12, 21/26
U.S. Cl. 250—218 3 Claims

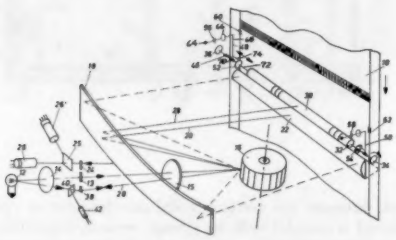



Visibility-responsive apparatus is disclosed in which a light beam is transmitted across a space, and the amount of light which is scattered in a predetermined direction relative to the beam is measured by an appropriately positioned light receiver, this amount being dependent on the optical extinction coefficient of the atmosphere within the space. In one embodiment, a second light receiver, directly in line with the beam, is provided, and the ratio of the outputs of the two light receivers is taken so as to eliminate variations in the transmitted beam intensity. In another embodiment, the second light receiver is used to maintain the intensity of the transmitted beam substantially constant. The apparatus may be modified to respond to non-visible radiation.

## 3,745,351
## APPARATUS FOR LINE-BY-LINE PHOTOELECTRIC SCANNING OF DATA MEDIA

Lothar Pudel, Neuried, Germany, assignor to Erwin Sick, Stifterweg, Germany

Filed July 3, 1972, Ser. No. 268,511
Claims priority, application Germany, July 20, 1971, P 21 36 115.9
Int. Cl. G01n *21/30*; G06k *7/00*
U.S. Cl. 250—219 D 3 Claims



A scanning head photoelectrically scans a data media moving along a path and a timing strip positioned in front of said path and transversely thereto. The timing strip is on a roller which is movable axially as well as rotationally. The timing strip is formed by a film produced by a photographic reproduction of a master, with the film being backed by a reversing reflection stratum. The combination produces a plurality of striations transversely to the roller, with the striations being slightly conical. When scanned by a light beam these produce timing pulses.

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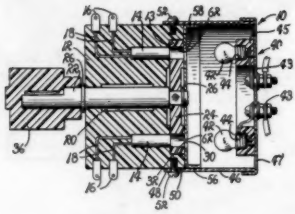
## 3,745,352
## RADIATION SENSITIVE SOLID STATE SWITCH

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert J. Hutto, Kent, Wash.

Filed Oct. 21, 1970, Ser. No. 82,649
Int. Cl. H01j *3/14*
U.S. Cl. 250—237 R 8 Claims

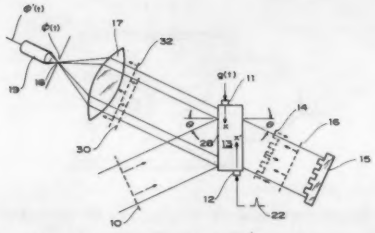


A mechanically operable solid state switch particularly suited for use in achieving a variable circuit-switching function in an environment wherein "bounce" and "arcing" between switch contacts are to be avoided, characterized by an annular array of photo-responsive switching devices, disposed in communication with an included source of radiation, and a plurality of interchangeable, mechanically operable interrupter disks, each having a predetermined pattern of transparent and opaque portions and adapted to be interposed in a masking relationship between the source of radiation and the array of photo-responsive devices, whereby an operative displacement of each disk serves to MAKE and BREAK selected electrical circuits through the photo-responsive devices of said array in sequences dictated by said pattern of the opaque and transparent portions of the interrupter.

## 3,745,353
## BRAGG ANGLE COLLINEAR HETERODYNING FILTER

James L. Jernigan, Inyokern, and Thomas F. O'Neill, Jr., China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1971, Ser. No. 192,458
Int. Cl. G02f *1/18*
U.S. Cl. 250—216 4 Claims



A Bragg angle matched filter wherein the light rays reflected by the delay cell are combined with the modulated rays which rebound from the wave plate and travel back through the delay cell. The combined rays are converged by a lens onto an aperture. A photodetector beyond the aperture yields an output proportional to the intensity of the converged wave. Planar waves entering the lens give a maximum output from the photodetector and, therefore, indicate a correlation peak.

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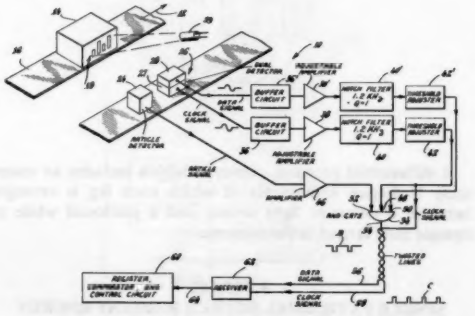
## 3,745,354
## DETECTOR FOR READING BAR CODES ON MOVING ARTICLES AND HAVING IMPROVED SIGNAL-TO-NOISE RATIO

Donald P. Vargo, Chester, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 23, 1971, Ser. No. 136,769
Int. Cl. G08c *9/06*
U.S. Cl. 250—219 D 4 Claims



A detection system is provided of the type used for reading bar coded indicia on articles passing on a moving conveyor and for emitting a corresponding output signal to be used in subsequently manipulating the articles. To reduce noise in the output signal and so to provide an improved signal-to-noise ratio and more accurate manipulation of the articles in response to the code, the detection system is arranged to be selectively responsive not only to the frequency characteristic of the spacing of the coded bars, relative to their speed of passage, but also similarly responsive to the frequency characteristic of the width of the bars in the code. This predetermined detection frequency is established in the coded indicia

by giving each individual bar a uniform width dimension, preferably equal to the spacing between adjacent bars. The detector includes a notch filter passing this predetermined frequency so that wide band noise and spurious signals developed at other frequencies will be eliminated from the output signal.

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**3,745,355**

## LABEL HOLDER FOR AUTOMATIC CAR IDENTIFICATION SYSTEM

**James H. Seamon, 7928 Kingwood Avenue, Afton, Mo.**

**Filed Dec. 14, 1971, Ser. No. 207,879**
**Int. Cl. G08c** *9/06*
**U.S. Cl. 250—219 D** **7 Claims**

An Automatic Car Identification (ACI) system for identifying individual railroad cars includes an information label on each car that can be scanned by a beam from a source of radiant energy at a scanner mounted adjacent to the track of motion of the car. That portion of the radiant energy which is reflected from coded modules of the label is received and processed at the scanner to produce classification signals indicative of the label being scanned. An improved support for the components of the label has a plurality of inclined surfaces which carry the modules in such a manner that the coded reflective surfaces in each module are directed toward the optical center of the system at the scanner.

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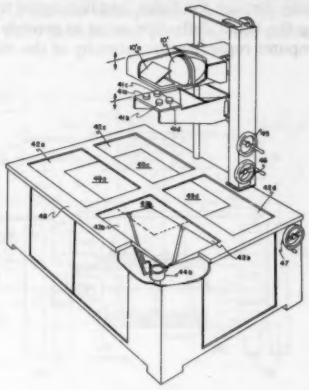
**3,745,356**

## ELECTRO-OPTICAL APPARATUS FOR SIMULTANEOUSLY SCANNING A SET OF TRANSPARENCIES

**Nicholas J. Reeber, Hauppauge, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.**

**Division of Ser. No. 874,550, Nov. 6, 1969, abandoned. This application Dec. 23, 1971, Ser. No. 211,797**
**Int. Cl. H01j** *39/12*
**U.S. Cl. 250—220 R** **9 Claims**

Disclosed is novel electro-optical apparatus useful for scanning simultaneously, in parallel, the four photographic transparencies of a four-color separation set. The electro-optical apparatus utilizes a bank of four lenses to simultaneously image the raster of a scanning light source onto each of four corresponding color separation transparencies which are positioned in a rectangular array in a common plane. The scanning light transmitted by each transparency is independently collected and detected to generate a set of output signals, each of which is representative of the transmissivity of successively scanned elemental areas of a corresponding one of the separation transparencies. The relative positions of the scanning light source, the bank of lenses and the set of color separations



are readily adjustable, thereby permitting the apparatus to scan color separation transparency sets of different dimensions.

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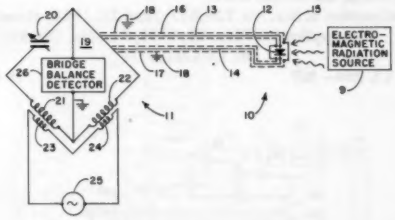
**3,745,357**

## METHOD AND APPARATUS FOR MEASURING ELECTROMAGNETIC RADIATION

**Julian F. Been, Medina, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Jan. 6, 1971, Ser. No. 104,346**
**Int. Cl. G01t** *1/24*; **H01l** *15/00*
**U.S. Cl. 250—336** **3 Claims**




An apparatus and method wherein the capacitance of a semi-conductor junction subjected to an electromagnetic radiation field is utilized to indicate the intensity or strength of the electromagnetic radiation is described.

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**3,745,358**

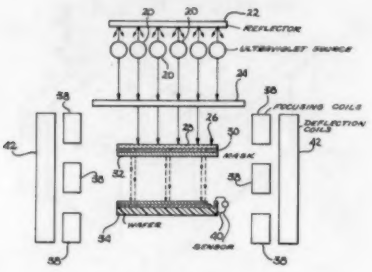
## ALIGNMENT METHOD AND APPARATUS FOR ELECTRON PROJECTION SYSTEMS

**Richard B. Firtz, Thousand Oaks; William R. Livesay, Camarillo, and Malcolm E. Wing, Agoura, all of Calif., assignors to Radiant Energy Systems, Inc., Newbury Park, Calif.**

**Filed May 10, 1971, Ser. No. 141,837**
**Int. Cl. H01j** *37/26*
**U.S. Cl. 250—365** **21 Claims**

An alignment method and apparatus for electron projection systems whereby the electron image may be automatically aligned with respect to the surface of the article on which the electron image is to be projected. The article to receive the electron image is provided with reference holes perpendicular to the surface which is to receive the electron image and extending through the article. Electron beams are first directed only to the general vicinity of the reference holes and are

deflected by the deflection means for the electron beam so as to scan the general vicinity of the holes. A sensor is located in the apparatus beneath each of the holes to detect the electron beam passing through the holes, and is coupled to a computer controlling the beam deflection so as to provide information to the computer regarding the intensity of the electron beam




passing through the alignment holes. The computer is programmed to control the beam and to operate on the information obtained from the sensor so as to determine the proper deflection means control signal for aligning the electron image with respect to the reference holes. Various scanning methods and beams of various characteristics are disclosed.

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**3,745,359**

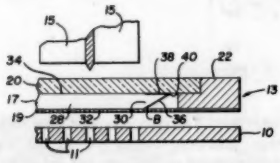
**SCINTILLATION CRYSTAL WITH REFLECTION INHIBITING MATERIAL AND SCINTILLATION DEVICE EMBODYING THE CRYSTAL**

**Ronald J. Martone, Cheshire, Conn., assignor to Picker Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 739,837, June 25, 1968, abandoned. This application Mar. 22, 1971, Ser. No. 126,915**

**Int. Cl. G01t *1/20***

**U.S. Cl. 250—369** **19 Claims**



A scintillation camera includes an input phosphor, for producing scintillations in response to gamma rays and like radiation, in the form of a sheet of photofluorescent material having a wedge-shaped peripheral surface coated with a substantially non-reflective material to reduce the amount of light reflected from the peripheral surface.

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**3,745,360**

**RADIATION CIRCUIT RADIATION DETECTOR**

**Bernt Paul, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

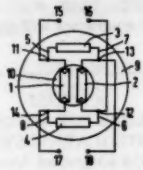
**Filed Mar. 17, 1970, Ser. No. 20,213**

**Claims priority, application Germany, Mar. 21, 1969, P 19 14 467.3**

**Int. Cl. G01t *1/16***

**U.S. Cl. 250—83.3 H** **1 Claim**

A radiation detector for sensing radiation has a plurality of radiation-sensitive resistances arranged in a bridge circuit, the latter being formed from a crystal so as to be a monolithic entity. The crystal consists of a material having a resistivity sensi-



tive to radiation, whereby the bridge circuit becomes electrically unbalanced when a portion of the resistances is placed in the path of the radiation.

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**3,745,361**

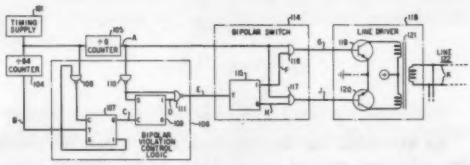
**COMPOSITE CLOCK SIGNAL GENERATING AND DISTRIBUTING CIRCUITS**

**Kenneth Williamson Boyd, Edison; Burton R. Saltzberg, Middletown, and Herbert Mortimer Zydney, Rumson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed June 27, 1972, Ser. No. 266,686**

**Int. Cl. H02j *3/02***

**U.S. Cl. 307—3** **8 Claims**




A 64 kHz clock signal is converted to a pulse train, an 8 kHz clock signal is superimposed thereon, and the composite signal is distributed by a balanced floating pair of line leads to terminator circuits located throughout a synchronous central office. The composite signal format comprises alternating polarity pulses having a violation each eighth pulse in that the pulse has the same polarity as the preceding pulse. Successive pulse violations alternate in polarity whereby the pulse train has the advantages of having no dc component and being polarity insensitive, the latter advantage permitting the terminator circuits to recover the clock signals even though the connection of the leads of the line be reversed.

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**3,745,362**

**TWO RELAY CONTROL CIRCUIT FOR AUTOMOTIVE VEHICLES**

**Richard P. Ballou, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.**

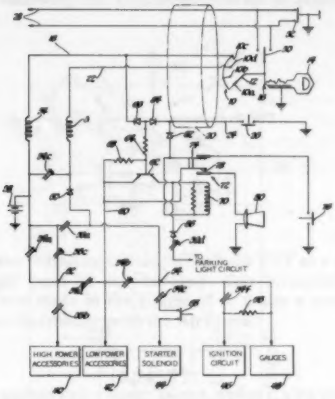
**Filed May 22, 1972, Ser. No. 255,790**

**Int. Cl. H02j *1/00***

**U.S. Cl. 307—10 R** **3 Claims**

A circuit for enabling the accessories, starter solenoid, ignition circuit and gauges of an automotive vehicle includes an ignition switch with its movable contact connected to ground through a key and two output conductors, each in series with a relay, which are selectively energized, singly or together, according to the switch position. A switching network containing several switches, each operated by one of the relays, is arranged so that the low power accessories are energized when the switch is in the off position and one relay is energized, the starter solenoid ignition circuit and the gauges are energized when the switch is in the start position and both relays are energized, and all the utilization circuits are enabled when the

switch is in the on position and the second relay is energized. An auxiliary circuit provides for horn operation and audible




warnings when the vehicle lights are on or the key is inserted in the ignition switch when a vehicle door is open.

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**3,745,363**

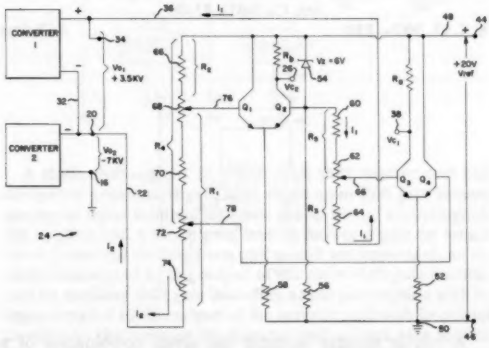
**REGULATED FLOATING OUTPUT**

**Charles Nelson Fendrich, Jr., Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Aug. 12, 1971, Ser. No. 171,050**

**Int. Cl. G05f 1/56**

**U.S. Cl. 307—34** **5 Claims**




A dual output voltage regulator supplying regulated voltages of opposite polarity regulates the first output by a differential error detecting circuit referenced to a constant voltage. The other regulated output of opposite polarity is referenced directly to the first output and is controlled by the second differential error detecting circuit, without being influenced by regulation of the first output.

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**3,745,364**

**TIME INTERVAL INTERPOLATOR**

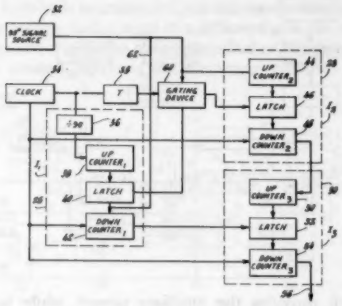
**Hans G. Blank, Brookline, and Arthur Margolies, Framingham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Feb. 7, 1972, Ser. No. 224,209**

**Int. Cl. H03k 21/00**

**U.S. Cl. 328—41** **15 Claims**

A time interval interpolator for producing a series of pulses defining an interval between adjacent input pulses, as in degree points relative to a 90° reference, including a first interpolator producing a first series of pulses referenced to the period of time necessary for a 90° pulse to occur after a fixed time interval, a second interpolator producing a reference count, and a third interpolator providing the desired output




from the ratio of the first and second interpolation units. A further embodiment employs two level interpolation employing one 90° period to set up a time base and includes means for preventing more than a fixed number of pulses from being producing in an interval between adjacent input pulses.

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**3,745,365**

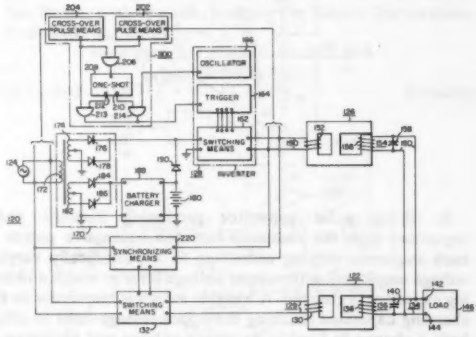
**HIGH INTEGRITY ALTERNATING CURRENT POWER SUPPLIES**

**Robert J. Spreadbury, Murrysville, and Terence D. Malarkey, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Apr. 23, 1971, Ser. No. 136,742**

**Int. Cl. H02j 9/00**

**U.S. Cl. 307—64** **4 Claims**




A high integrity alternating current power supply including at least two sources of alternating potential, and at least two parametric devices. The parametric devices permit power flow only from their input to their output circuits, enabling parallel operation of their output circuits without the necessity of providing means for preventing power flow into a faulted source of alternating potential.

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**3,745,366**

**DUAL SOURCE AUXILIARY POWER SUPPLY**

**Martin Simon, Erie, Pa., assignor to General Electric Company, Erie, Pa.**

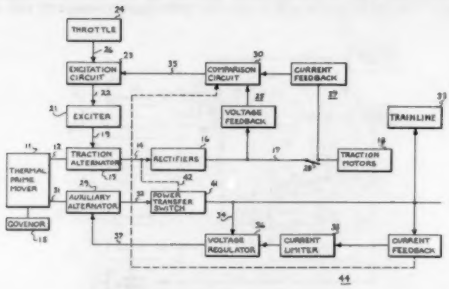
**Filed Nov. 4, 1971, Ser. No. 195,753**

**Int. Cl. H02j 9/04**

**U.S. Cl. 307—68** **3 Claims**

An auxiliary power supply system for providing controlled alternating current in an electric motor traction vehicle driven

by a prime mover through a traction alternator. During normal traction operation the prime mover operates at a high constant rotational speed to directly drive an auxiliary alternator which provides the auxiliary power, while in standby operation the prime mover operates at a reduced constant rotational speed and the auxiliary power is obtained from the traction alternator at the desired frequency and voltage.

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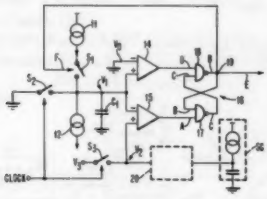
**3,745,367**

**METHOD AND APPARATUS FOR GENERATING TIMING PULSES WITH VARYING DISTANCES**

**Hans R. Schindler, Au, and Peter Vettiger, Thalwil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 2, 1972, Ser. No. 249,581**
**Int. Cl. H03k** *3/00*
**U.S. Cl. 307—108** **13 Claims**




A timing pulse generator producing periodic pulse sequences with the distances between successive pulses in each sequence varying according to a periodically varying voltage employed as the upper voltage limit to which a charging capacitor is charged. A bistable switch is responsive to the charging capacitor reaching the upper voltage limit to effect both a change in level in its output voltage and discharge of the capacitor to a lower voltage limit. Upon the charging capacitor reaching the lower voltage limit the bistable switch is again responsive to effect both a change in level in its output voltage back to its original level and the charging of the capacitor.

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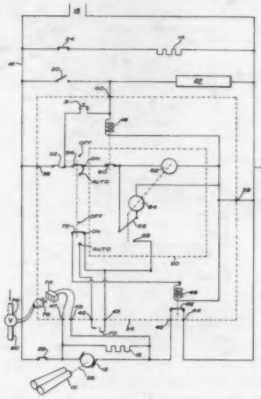
**3,745,368**

**PHOTOGRAPHIC DEVELOPING MACHINE AUTOMATIC CUTOFF**

**Oliver V. Spicer, Lubbock, Tex., assignor to Interstate Instruments, Inc., Lubbock, Tex.**

**Continuation-in-part of Ser. No. 887,716, Dec. 29, 1969, Pat. No. 3,619,542. This application Aug. 16, 1971, Ser. No. 172,183**
**Int. Cl. H01h** *35/00*
**U.S. Cl. 307—116** **9 Claims**

In a machine for processing photographic film, a main switch in the main power supply to the machine is normally held in the closed position so the machine runs. A timing circuit is reset each time film is fed into the machine. At a set time after the last film is fed into the machine, an electro magnetic solenoid opens this main switch to automatically cut off the machine. A thermostatic switch is provided in the solenoid circuit to inactivate the solenoid to permit the machine to turn on again in the event the machine becomes cool.



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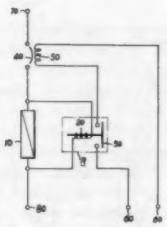
**3,745,369**

**CIRCUIT BREAKER**

**Kiyoshi Yamagata, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed June 5, 1972, Ser. No. 259,870**
**Int. Cl. H01h** *35/00*
**U.S. Cl. 307—131** **4 Claims**



A circuit breaker includes the series combination of a breaker element and a self-restoring type current limiter in a feeder circuit. The self-restoring type current limiter responds to the current of the feeder circuit. A relay is provided and responds to the voltage between both of the terminals of the self-restoring type current limiter so as to cause a breaking operation of the breaker under abnormal operating conditions.

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**3,745,370**

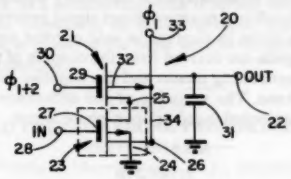
**CHARGE CIRCUIT FOR FIELD EFFECT TRANSISTOR LOGIC GATE**

**Raymond A. Kjar, Newport Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.**

**Filed Dec. 2, 1971, Ser. No. 204,246**
**Int. Cl. H03k** *19/08*
**U.S. Cl. 307—205** **5 Claims**

A logic gate having a field effect transistor (FET) connected between an output capacitor and an input logic network. An electrical contact provided to the FET base (substrate) region receives a precharge signal for precharging the

output capacitor through the FET base-drain diode junction and for precharging capacitance of the logic network through the FET base-source diode junction. The logic network is evaluated following the precharge interval to conditionally




discharge the output capacitor through the FET as a function of the logic state of the network. The invention herein described was made in the course of or under a contract or subcontract thereunder, with the Air Force.

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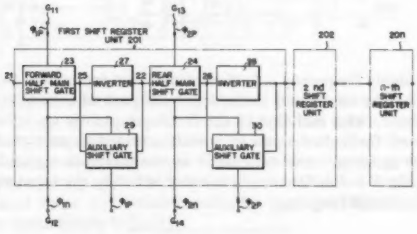
**3,745,371**

## SHIFT REGISTER USING INSULATED GATE FIELD EFFECT TRANSISTORS

**Yasoji Suzuki, Kawasaki-shi, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Aug. 10, 1971, Ser. No. 170,610**
**Int. Cl. G11c *11/40***
**U.S. Cl. 307—221 C** **8 Claims**




A static shift register in which each shift register unit half comprises a main shift gate including a main shift gate section having an input terminal to which preset binary coded signals are applied and a clock gate section having a gate on which clock pulses for shifting from unit to unit are impressed, an inverter connected to the output of the main shift gate section, and an auxiliary shift gate including a shift gate section with its input coupled to the output of the inverter and with its output coupled to the input of the inverter and a clock gate section having a gate on which clock pulses with a phase inverted with respect to that of the first-mentioned clock pulses are impressed.

The main and auxiliary shift gate section, the main and auxiliary clock gate section, and the inverter each comprises a complementary pair of insulated gate enhancement type field effect transistors.

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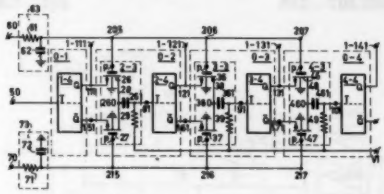
**3,745,372**

## ASYNCHRONOUS ADDING-SUBTRACTING DEVICE

**Johannes Karolus Andread Koster, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 13, 1971, Ser. No. 207,018**
**Claims priority, application Netherlands, Dec. 16, 1970, 7018307**
**Int. Cl. H03k *21/00***
**U.S. Cl. 307—222 C** **4 Claims**

As asynchronous adding-subtracting device comprising a cascade-connection of N sections, each of which comprises a coupling circuit and a counting flipflop. Each counting flipflop comprises a counting input and two signal outputs supplying inverted output signals. Each coupling circuit comprises two input terminals which are connected to the signal outputs of a counting flipflop of a preceding section, one output terminal which is connected to the counting input of the counting flipflop of the same section, and two control terminals. Each of the input terminals is connected, via the conducting path of an electronic switch, to the input of a differentiator, the output of which is connected to the output terminal of the coupling circuit. The control inputs of the electronic switches are con-



nected to the control terminals and are connected to condition inputs via pulse-slope reducers. The pulses to be counted are applied to the counting input of the first counting flipflop. The condition signals determining the direction of counting are applied to the condition inputs. When the signals applied to the conditions inputs are exchanged, the voltage variation occurring on these terminals is applied to the control terminal by the pulse-slope reducers at a very small steepness, so that the electronic switches are gradually switched on and any voltage peaks produced by the differentiators cannot change the state of the counting flipflops.

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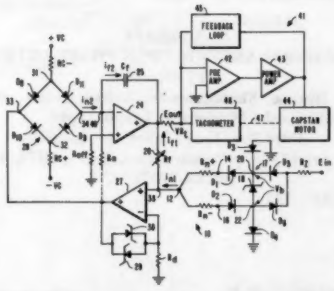
**3,745,373**

## PRECISION RAMP GENERATOR WITH PRECISE STEADY STATE OUTPUT

**Hale M. Jones, Playa Del Rey, and Richmon E. Deas, Manhattan Beach, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.**

**Filed Mar. 3, 1972, Ser. No. 231,615**
**Int. Cl. H03k *4/08***
**U.S. Cl. 307—228** **9 Claims**




A capstan motor drive circuit for a tape transport includes a precision, dual polarity ramp generator circuit having an input diode bridge circuit with a cross-coupling Zener diode arranged to provide precisely controlled currents of opposite polarities at a summing junction in response to positive and negative input levels respectively. A constant current source activated by the current at the summing junction is connected to drive a single operational amplifier having capacitive feedback and acting as an integrating amplifier to generate both positive and negative ramp signals. A single variable resistance in a feedback coupling between the output of the operational amplifier and the summing junction controls the amplitude of the ramp for both polarities. The output returns to a precise zero point in the absence of an input and any small variations in the output affect both positive and negative ramps equally.

Direct coupling between the integrating amplifier and a capstan servo loop permits greatly improved system response by providing a constant input impedance.

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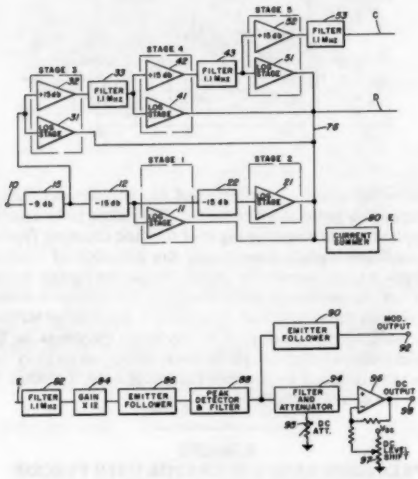
### 3,745,374
### LOGARITHMIC AMPLIFIER AND LIMITER

**Joel Hecker, and Robert Zinke, both of Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 26, 1972, Ser. No. 220,985**
**Int. Cl. G06g** *7/12, 7/24*
**U.S. Cl. 307—230** **5 Claims**




A solid state logarithmic amplifier and limiter device using seven logarithmic stages to achieve a 70 db logarithmic range. Without the use of vacuum tubes or diodes, the input voltage is attenuated and amplified in separate channels to produce seven logarithmic currents which are summed to produce the log amplified and limited output.

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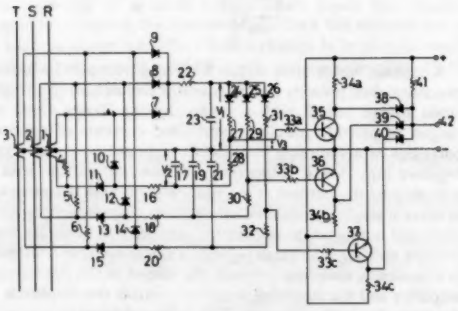
### 3,745,375
### PHASE UNBALANCE OR OPEN-PHASE DETECTING APPARATUS

**Mituhiro Huruse, Shinagawa-ku, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan**

**Filed Dec. 1, 1971, Ser. No. 203,704**
**Claims priority, application Japan, Dec. 9, 1970, 45/109866**
**Int. Cl. H03k** *5/20*
**U.S. Cl. 307—231** **6 Claims**




A plurality of current transformers have primary windings connected to a phase signal circuit and secondary winding each having a plurality of terminals, respectively. One terminal of the secondary windings is connected to a positive direct signal generating means in common to said current transformers so that a constant voltage signal is held thereat when there is at least one of the phase signals in a normal condition. The other terminals of the secondary windings are connected to a plurality of negative direct signal generating means which are the same in number as said current transformers. Difference signals are derived from the outputs of the positive direct signal generating means and the negative direct signals generating means. The variation of the difference signals indicate the phase unbalanced or open-phase signal.

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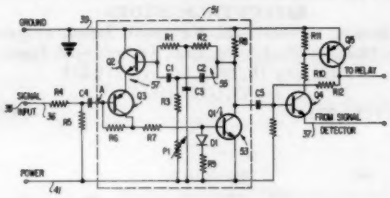
### 3,745,376
### FREQUENCY SELECTIVE CIRCUIT INCLUDING A TWIN-T NOTCH FILTER

**Alexander C. McIntosh, Oak Harbor, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.**

**Filed Apr. 28, 1972, Ser. No. 248,397**
**Int. Cl. H03k** *5/20*
**U.S. Cl. 307—233** **3 Claims**




A highly frequency selective circuit that includes a twin-T notch filter connected in the feedback path of a transistor is disclosed. Also included in the feedback path is an isolation network formed of a pair of emitter coupled transistors. One of the isolation transistors is fed by the feedback signal from the twin-T notch filter and the other is fed by the input signal to the overall frequency selective circuit.

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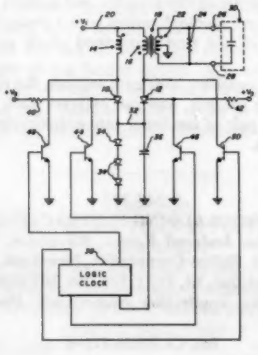
### 3,745,377
### PULSE DRIVE CIRCUIT

**Robert W. Johnson, Bloomington, Minn., assignor to Control Data Corporation, Minneapolis, Minn.**

**Filed Dec. 22, 1971, Ser. No. 210,844**
**Int. Cl. H03k** *17/72*
**U.S. Cl. 307—252 J** **8 Claims**




A pulse generator driver supply in which a pair of oppositely phased SCR's are connected to primary terminations of a

transformer. The SCR's are individually turned on to form opposite halves of a bi-polar pulse cycle by transistors unclamping the firing voltage to the gate of the SCR to be turned on. A plurality of diodes are in series with the paralleled cathodes of the SCR's to cause shut off, terminating the respective half cycles of pulses, as a control transistor is turned on between the anode of the respective SCR and ground, biasing the individual SCR to cutoff at the same time as the gate firing voltage is again clamped.

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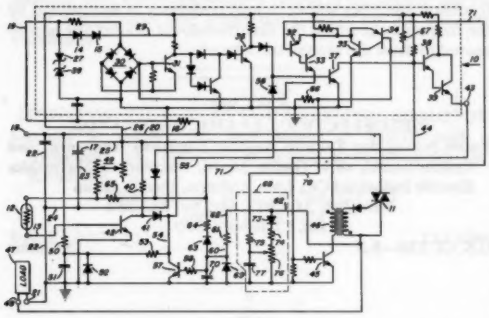
**3,745,378**

## ZERO VOLTAGE FIRING PROPORTIONAL CONTROLLER

**Wayne W. Pritchett, Morris Plains, N.J., assignor to RFL Industries, Inc., Boonton, N.J.**

**Filed Jan. 28, 1972, Ser. No. 221,739**
**Int. Cl. H03k** *17/72*
**U.S. Cl. 307—252 B** **5 Claims**



A proportional controller in which a triac is controlled by a zero-voltage switch responsive to changes in a sensor having a negative temperature coefficient of resistance. The triac supplies electrical power to a load and the circuit is so arranged that for every positive half-cycle of power which is applied to the load there will be an equal and opposite negative half-cycle immediately following.

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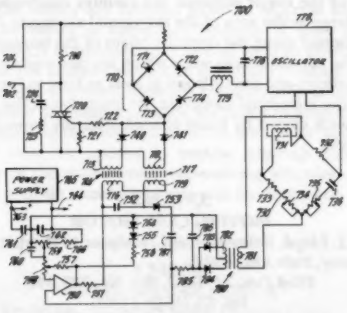
**3,745,379**

## THYRISTOR CONTROL CIRCUITS INCLUDING MEANS FOR SENSING THE PRESENCE OF AN OBJECT

**Thomas A. O. Gross, Lincoln, Mass., assignor to Arrow-Hart, Inc., Hartford, Conn.**

**Filed Sept. 8, 1971, Ser. No. 178,551**
**Int. Cl. H03k** *17/68, 17/72;* **G08b** *13/26*
**U.S. Cl. 307—252 B** **28 Claims**




Thyristor control circuits for the control of alternating circuit power to loads, which circuits operate efficiently and with a minimum of radio frequency interference; and sensor probes which are particularly useful in connection with the thyristor triggering in such circuits.

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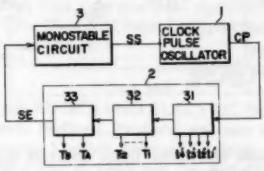
**3,745,380**

## APPARATUS FOR CONTROLLING CLOCK PULSES

**Kenichi Kitajima, No. 5-31 Imazato Hachinotsubo, Nogoaka-cho; Akira Nagano, No. 1-5, Touwaen, Nagoaka-cho, and Masatoshi Mitsui, c/o Mr. Shinzo Nakakouji, No. 3, Shimokaiinji Nishijyo, Nagoaka-cho, all of Otokuni-gun, Japan**

**Continuation-in-part of Ser. No. 829,589, June 2, 1969, abandoned. This application Sept. 16, 1971, Ser. No. 180,994**
**Claims priority, application Japan, June 3, 1968, 43/37850**
**Int. Cl. H03k** *5/00*
**U.S. Cl. 307—260** **9 Claims**




A timing pulse generator, which produces a plurality of timing pulses, is controlled by a series connected arrangement of a monostable-multivibrator and a clock pulse generator. The monostable multivibrator or delay is triggered by an output from the timing pulse generator, so as to render the clock pulse generator disabled for a predetermined period of time, whereby both clock pulses and timing pulses will be inhibited for the predetermined period of time.

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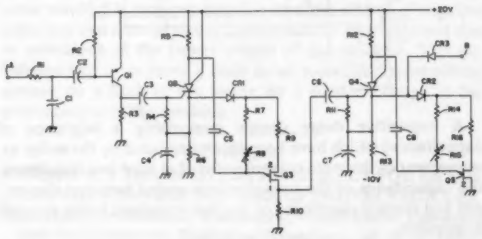
**3,745,381**

## ANGULAR DECEPTION JAMMER PROVIDING ADJUSTABLE WIDTH PULSES AFTER ADJUSTABLE TIME

**William N. Kelly, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 7, 1972, Ser. No. 216,034**
**Int. Cl. H03k** *1/18*
**U.S. Cl. 307—265** **1 Claim**

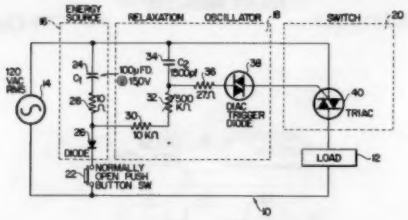


A radar electronic counter-measure device comprising first and second cascaded monostable multivibrators. The first multivibrator is triggered to its unstable state by a pulse from the radar. When the output of the first multivibrator returns to its stable state, it initiates operation of the second multivibrator. The output of the second multivibrator is a pulse whose width is determined by adjustment of the period of the second multivibrator, and whose start-time is determined by adjustment of the period of the first multivibrator.

## 3,745,382
## SOLID STATE TIMER CIRCUIT FOR CONTROLLING THE ENERGIZATION TIME OF A LOAD

**Henri H. Hoge, Baltimore, and Lawrence S. Nickel, Cockeysville, both of Md., assignors to Rhomega Systems, Inc., Cockeysville, Md.**

**Filed Feb. 18, 1972, Ser. No. 227,362**
**Int. Cl. H03k** *17/26*
**U.S. Cl. 307—293** **12 Claims**




The solid state electronic timer controls the time of load energization with a bidirectional solid state switching device. Upon the operation of a timer actuating unit, a large capacitor is charged to provide a charge for a small capacitor in a relaxation oscillator circuit. The relaxation oscillator output is supplied to gate the bidirectional solid state switching device. Since the current necessary to operate the relaxation oscillator is small, timing cycles in the range of many minutes are provided without resort to physically large capacitors.

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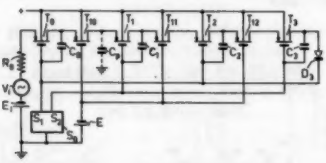
## 3,745,383
## IMPROVED BUCKET BRIGADE DELAY LINE

**Frederik Leonard Johan Sangster, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 88,684, Nov. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 675,883, Oct. 17, 1967, Pat. No. 3,546,490. This application Mar. 3, 1972, Ser. No. 231,765**
**Claims priority, application Netherlands, Sept. 25, 1970, 7014136**
**Int. Cl. H03k** *17/26*
**U.S. Cl. 307—293** **6 Claims**



A capacitive delay device comprising a sequence of capacitances which have been interconnected by the series arrangement of the main current paths of at least two transistors, the capacitance of the capacitor connected between the output and control electrodes of the first transistor being as small as possible.

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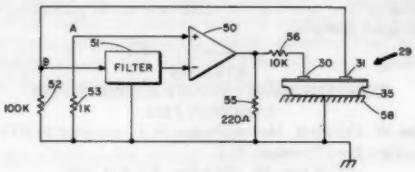
## 3,745,384
## RESONANT PRESSURE SENSOR

**William Carroll Blanchard, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Jan. 7, 1972, Ser. No. 216,074**
**Int. Cl. H04r** *17/00*
**U.S. Cl. 310—8.2** **9 Claims**

A pressure responsive diaphragm or capsule having a variable self-resonant frequency characteristic is excited to vibrate in a mode other than the fundamental or $f_{01}$ mode, that is, vibration occurs in a mode wherein at least first and second portions of the diaphragm are simultaneously moving 180° out of phase with respect to one another. This is accomplished by suitably coupling first and second electromechanical transducers to the first and second diaphragm portions respectively. A feedback amplifier whose output frequency is determined by the frequency at which the first transducer is vibrating is connected to drive the second transducer.

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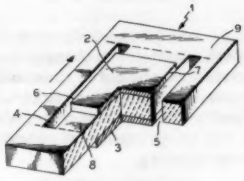
## 3,745,385
## PIEZOELECTRIC CERAMIC RESONATOR

**Yasuo Nakajima; Takashi Nagata; Kiyokazu Hagiwara, and Reiichi Sasaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan**

**Filed Jan. 31, 1972, Ser. No. 222,254**
**Int. Cl. H04r** *17/00*
**U.S. Cl. 310—9.5** **3 Claims**



A piezoelectric ceramic resonator vibrating resonantly in a thickness-shear vibration mode, which is free from unwanted vibrations in a high frequency range. The piezoelectric ceramic resonator comprises a thin wafer of piezoelectric ceramic material polarized in a direction parallel to the major surfaces thereof. A tetragonal electrode is applied to a part of one of the major surfaces, and a counter electrode is applied to another of the major surfaces, the counter electrode being at least as large as the area of the tetragonal electrode. Two slots are positioned along the opposite edges of the tetragonal electrode. The two slots have walls which are perpendicular to the major surfaces and the slots are at least as long as the opposite sides of the tetragonal electrode. At least one of the two slots has the ends closed by being spaced inwardly from the edges of the wafer.

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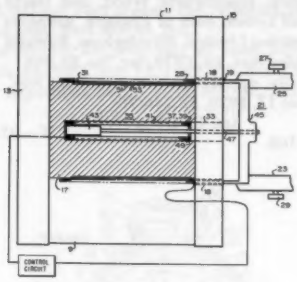
## 3,745,386
## MOVING COIL MOTOR

**William J. Lloyd, Belmont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Feb. 28, 1972, Ser. No. 229,890**
**Int. Cl. H02k** *41/02*
**U.S. Cl. 310—13** **1 Claim**

An improved linear motor includes a motior transducer disposed within the core section of the magnetic circuit for the shuttle of the linear motor to provide a velocity output signal substantially unaffected by magnetic fields and eddy currents associated with current in the linear motor coil. The positional

adjustment of the magnetic transducers carried by the shuttle of the linear motor is facilitated by the cam action of an adjustment tool which fits within a recess in the shuttle and engages a transverse slot within the support for the magnetic transducer.



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**3,745,387**

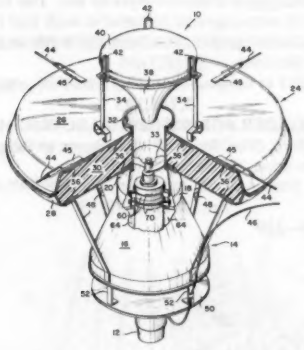
**MOUNTING STRUCTURE FOR A SUBMERGED MOTOR**

**Garland S. Sydnor, Jr., and Robert C. Dively, both of Richmond, Va., assignors to Sydnor Hydrodynamics Inc., Richmond, Va.**

**Filed Feb. 24, 1971, Ser. No. 117,921**

**Int. Cl. H02k** *5/24*

**U.S. Cl. 310—51** **12 Claims**



A mounting structure for a submerged motor wherein vibrations of the motor are isolated from an external supporting frame. The motor is suspended beneath at least one float member which is attached to a shroud used to direct cooling water over the exterior surface of the motor. Vibration damping means are provided between the shroud and the motor. The vibration damping means are secured to a plurality of vertically extending bars located between the shroud and the motor. The bars are spaced at regular intervals around the periphery of the motor and serve with the vibration damping means to provide vanes which prevent the formation of a vortex.

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**3,745,388**

**AXIAL AIR GAP MOTOR**

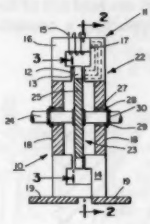
**Dean M. Frederick, 722 Ridge Road, Orange, Conn.**

**Filed Aug. 11, 1971, Ser. No. 170,720**

**Int. Cl. H02k** *37/00*

**U.S. Cl. 310—49** **6 Claims**

An axial air gap motor for A.C. or D.C. operation having a disc-shaped non-magnetic rotor supporting a plurality of equally spaced ferro-magnetic pole pieces therein, and a C-shaped stator comprising a plurality of individual pole pieces greater in number than the rotor pole pieces selectively energized to attract the displaced rotor pole pieces into alignment with the stator pole pieces.



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**3,745,389**

**SUPERCOOLED DYNAMO ELECTRIC MACHINES**

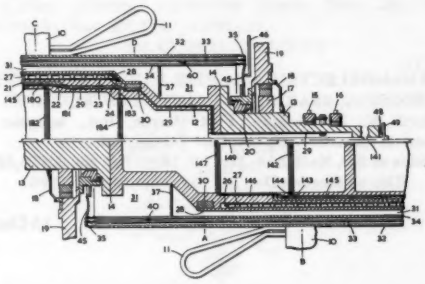
**Hugh Olaf Lorch, Stafford, England, assignor to The English Electric Company Limited, London, England**

**Filed Aug. 8, 1969, Ser. No. 848,521**

**Claims priority, application Great Britain, Aug. 9, 1968, 38,193/68**

**Int. Cl. H02k** *9/19*

**U.S. Cl. 310—52** **42 Claims**



A synchronous dynamo electric machine having a stator and a rotor in which the rotor has a superconductive direct current field winding which is maintained at a very low temperature. In order to shield the superconductive field winding from alternating or suddenly changing magnetic fields which would otherwise be set up therein the rotor includes an outer annular shield of good electrically conductive material. The rotor winding is thus protected against the effects of negative sequence and zero sequence components of stator current due to unbalance of the power output of the machine. This unbalance can arise from a fault in an associated transmitting system, or a fault in the stator, or a sudden change in the power output of the machine.

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**3,745,390**

**FREQUENCY TRANSMITTER ESPECIALLY FOR BRAKE SLIPPAGE CONTROL SYSTEMS OF MOTOR VEHICLES**

**Manfred H. Burckhardt, Waiblingen; Walter Lutze, Esslingen, and Paul Schwerdt, Esslingen-Hegensberg, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

**Filed Sept. 16, 1971, Ser. No. 181,005**

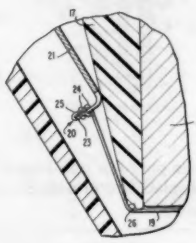
**Claims priority, application Germany, July 14, 1971, G 70 34 511.8**

**Int. Cl. H02k** *11/00*

**U.S. Cl. 310—71** **10 Claims**

A frequency transmitter producing pulses at a high repetition rate for determining the rotary behavior of wheels, especially for brake slippage control installations of motor vehicles, in which a non-rotating part cooperates with a rotating

part by means of teeth, and in which a coil producing a magnetic field is arranged in the non-rotating part; whose ends are connected with connecting terminals, for example, plug contacts; the ends of the coil are lead out of the coil to connecting lugs of the contacts, bypassing a considerable intermediate



space, and are connected with these lugs whereby the connecting lugs themselves are also extended out of the contacts to the places where the actual connections take place, so that the connecting places for the coil ends are relieved from tensional loads and stresses.

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**3,745,391**

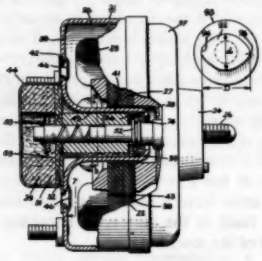
**DYNAMOELECTRIC MACHINE HAVING IMPROVED HOUSING, BEARING AND SUPPORT STRUCTURE**

**Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.**

**Division of Ser. No. 6,664, Jan. 29, 1970, Pat. No. 3,670,405. This application Dec. 23, 1971, Ser. No. 211,590**

**Int. Cl. H02k** *5/16*

**U.S. Cl. 310—90** **13 Claims**



A stator assembly is pressed into a housing member having an end frame and bearing receiving chamber. Bearing means sized to close tolerances have angularly spaced apart surface areas secured to an interior wall of the bearing receiving chamber and define lubricant transmitting channels therewith. The bearing means are slidably received in the chamber and secured therein by an inteference fit or structural adhesive material. An oil cover is mechanically secured to an end frame by fasteners expanded in openings in the frame. The openings may be used, prior to securement of the oil cover, to permit removal of rotor centering shims from the machine air gap. In a preferred arrangement, the fasteners are secured to the frame without the application of substantial resultant forces to the end frame and bearing means.

**3,745,392**

**DEVICE FOR MEASURING THE FREQUENCY OF ROTATION OF A VEHICLE WHEEL**

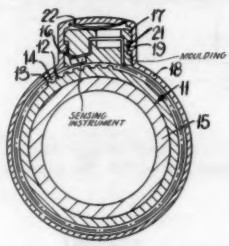
**Lancelot Phoenix, Handsworth Wood, and David Valentine Walpole, Hall Green, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Nov. 10, 1970, Ser. No. 88,368**

**Claims priority, application Great Britain, Nov. 10, 1969, 54,872/69; June 13, 1970, 28,746/70**

**Int. Cl. G01p** *3/48*

**U.S. Cl. 310—168** **8 Claims**




A device for measuring the frequency of rotation of a vehicle wheel comprises a toothed wheel rotatable with the vehicle wheel, and an electromagnetic pick-up winding past which in use the teeth move to produce pulses in the winding. The toothed wheel is provided with a layer of non-magnetic material which covers the crown of each tooth, the pick-up winding moving over the layer of the non-magnetic material and being resiliently urged towards the toothed wheel so as not to be disengaged from the layer in use. The arrangement of the layer of non-magnetic material is such that the winding remains at a constant distance from the teeth as the winding moves over the layer.

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**3,745,393**

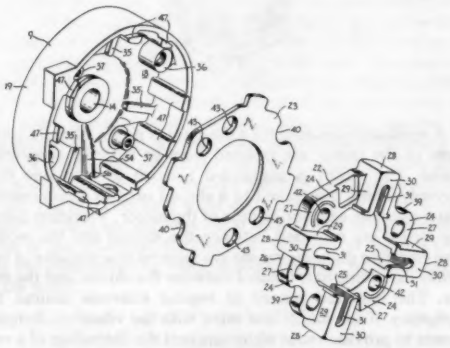
**BRUSH HOLDER FOR DYNAMOELECTRIC MACHINE**

**James A. Spors, West Bend, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.**

**Filed Apr. 28, 1972, Ser. No. 248,447**

**Int. Cl. H01r** *39/38*

**U.S. Cl. 310—239** **8 Claims**



A brush holder for a dynamoelectric machine comprises a molded carrier and a stamped washer-like member. The carrier is annular and has radially elongated brush receiving recesses, each of which opens radially inwardly and also opens unrestrictedly to one axial surface of the carrier so that it can be molded without need for movable cores. The washer-like member flatwise overlies said surface of the carrier, closing said recesses. Screws fasten the carrier and washer-like member into an end bell and also serve as terminals for grounded brush leads.

**3,745,394**

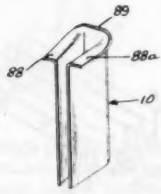
## ELECTRICAL INSULATORS FOR SLOTTED MAGNETIC CORES

**Lowell M. Mason, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.**

**Division of Ser. No. 845,996, July 30, 1969, which is a division of Ser. No. 653,983, July 17, 1967, Pat. No. 3,514,836. This application Dec. 7, 1971, Ser. No. 205,484**

**Int. Cl. H02k** *3/36*

**U.S. Cl. 310—215** **3 Claims**




Electrical insulators, for example, slot liners, are produced from an elongated continuous strip of dielectric material in the slots of a magnetic core. Individual pieces of dielectric strip material having different preselected sizes and desired configurations are then produced; and may have laterally extending portions and an intermediate axially extending bight portion at one end thereby permitting shorter coils to be used in the magnetic core while also allowing the coils to take a gradual bend adjacent the core, next to the bight portion, which tends to prevent damage to the coils.

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**3,745,395**

## SPACER FOR THE WINDINGS OF AN ELECTRICAL MACHINE

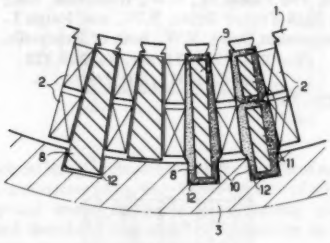
**Paul Koechlin, 90-Belfort, France, assignor to UNELEC, Paris, France**

**Filed Oct. 13, 1971, Ser. No. 188,873**

**Claims priority, application France, Oct. 13, 1970, 7037000**

**Int. Cl. H02k** *3/46*

**U.S. Cl. 310—260** **13 Claims**




A spacer for the windings projecting from the magnetic core of a motor or generator in the form of an arcuate support for attachment to the core and defining axially extending guides on which are mounted a set of circumferentially spaced and radially extending blades for separating the windings.

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**3,745,396**

## ELONGATED ELECTRON-EMISSION CATHODE ASSEMBLY AND METHOD

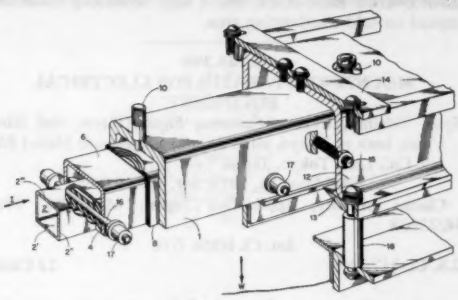
**Bertram S. Quintal, Peabody, and Derek J. Maynard, Danvers, both of Mass., assignors to Energy Sciences Inc., Burlington, Mass.**

**Filed May 25, 1972, Ser. No. 256,887**

**Int. Cl. H01j** *7/24, 61/52, 19/12*

**U.S. Cl. 313—37** **14 Claims**

This disclosure relates to generating an elongated electron beam curtain with the aid of an elongated tubular cathode structure transversely supported against sagging and distortion from a partially surrounding heat-reflecting thermal barrier




channel support, particularly adapted for mounting with Pierce type or other beam-forming electrode structures.

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**3,745,397**

## PYRAMIDAL GUN ARRAY HAVING RESILIENT MEMBER CONTACTING CORRESPONDING SUPPORTS OF EACH OF THREE GUNS

**Eiichi Yamazaki; Yukihiro Izumida, and Masanori Hirai, all of Mobara-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 776,025, Nov. 15, 1968, abandoned. This application June 28, 1971, Ser. No. 157,612**

**Claims priority, application Japan, Nov. 24, 1967, 42/98451; Nov. 27, 1967, 42/99159**

**Int. Cl. H01j** *29/50, 29/02*

**U.S. Cl. 313—70 C** **3 Claims**

There is disclosed a color picture tube having three electron gun units arranged in the form of a trigonal pyramid or prism within the neck of the tube, the corresponding electrodes of the respective electron guns, which are to be held at the same potential, being electrically connected mutually with a contact strip.

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**3,745,398**

## CATHODE RAY TUBE SCREEN HAVING CONTIGUOUS, OVERLAPPING COLOR AREAS

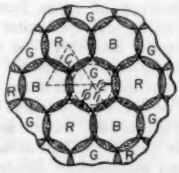
**Mitsuru Oikawa, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed July 1, 1970, Ser. No. 51,438**

**Claims priority, application Japan, July 4, 1969, 44/52481**

**Int. Cl. H01j** *29/30, 39/20*

**U.S. Cl. 313—92 B** **5 Claims**




A color picutre tube with a shadow mask provided therein, in which tri-color phosphor dots, constituting the screen of

the tube, are arranged such that the centers of the adjoining dots are located at the apices of a regular triangle and two of them overlap each other, and a light absorbing material is coated on said overlapping area.

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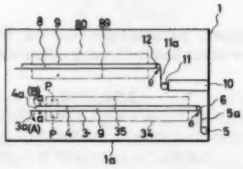
**3,745,399**
**MOUNTING APPARATUS FOR ELECTRICAL EQUIPMENT**

Syozi Usizima, Urama, Saitama; Sigeo Ohara, and Hirosi Unno, both of Tokyo, all of Japan, assignors to Meisei Electric Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1970, Ser. No. 19,737
Claims priority, application Japan, Mar. 26, 1969, 44/22838
Int. Cl. H05k 7/16
U.S. Cl. 317—99 12 Claims



In the disclosed apparatus, a cabinet encloses two panel assemblies, each of which is composed of two panels. In each assembly,two panels are articulated about a common hinge. Printed circuit boards are mounted on windows in the panels so that the backsides of the boards face each other. Spacer means on the panel prevent the backsides of the boards from striking each other as the panels swing close to each other. An extension arm,which is hinged to the wall of the cabinet,holds the hinge in the front one of the assemblies outward from the wall. A second extension arm, which is hinged to a post extending outward from the wall, holds the hinge of the rear of the two assemblies. Thus each of the assemblies is allowed to articulate on separate arms about separate hinges. These hinges are displaced laterally within the cabinet so that each assembly can be made to swing out of the cabinet without distrubing the other.

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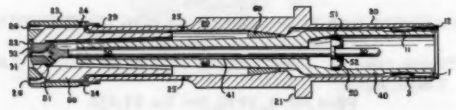
**3,745,400**
**IGNITER PLUG**

Helmut P. Meyer, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 23, 1972, Ser. No. 237,306
Int. Cl. H01t 13/00
U.S. Cl. 313—144 4 Claims

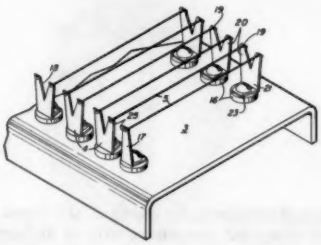


An igniter plug for a turbine engine capable of operating at high temperatures without failure of internal pressure seals that prevent the leakage of gases from the combustion chamber of the turbine through the igniter plug that adversely affect the ignition exciter assembly. The novel internal pressure seal within the igniter plug includes a cylindrical metal sleeve having a first portion brazed to an intermediate insulator that surrounds a central electrode and a second portion of larger diameter that has its edge welded around the periphery thereof to the igniter plug shell. This arrangement allows the igniter plug shell and intermediate insulator to expand and contract in response to extreme changes in temperature without breaking the pressure seal between the shell and the insulator.

**3,745,401**
**FILAMENT SUPPORT STRUCTURE FOR LARGE ELECTRON GUNS**

Robert E. Stapleton; John F. Weinbrecht; Edward O. Ferdinand, and James J. Hayden, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 15, 1972, Ser. No. 226,472
Int. Cl. H01j 1/90, 1/94
U.S. Cl. 313—272 5 Claims



An electron gun filament support structure in which the electron-emitting filaments are held in place by a plurality of opposing leaf springs. In a preferred embodiment, the springs are mounted on a filament tray, with the leaf of each spring extending substantially perpendicularly to the tray. Each leaf has one or more slots in its upper edge. The arms of each slot curve substantially outwardly from the opposing leaf springs, whereby a filament having enlarged end portions inserted in the slots of opposing leaf springs is held firmly in place under tension. Damaged or destroyed filaments may readily be removed and new filaments inserted by pressing opposed leafs toward each other, removing one filament, inserting another, and releasing the springs.

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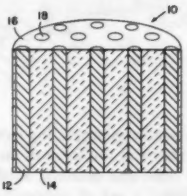
**3,745,402**
**FIELD EFFECT ELECTRON EMITTER**

Joe Shelton, 700 Tatom St., N.W., Huntsville, Ala.; Jerry W. Hagood, 3128 Tucker Drive, N.W., and Ralph L. Norman, 3644 Marymount Drive, N.W., both of Huntsville, Ala.

Filed Dec. 17, 1971, Ser. No. 209,328
Int. Cl. H01j 1/30, 1/90
U.S. Cl. 313—309 6 Claims



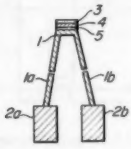
A unique electron source comprises an oxide-metal composite capable of emitting electrons at ambient temperatures when subjected to an electric field. The quantity of electrons emitted depends on the electric field provided for the emitter and thermionic emission is not employed during any stage of emission. The electron source, a field effect emitter, can have more than a million metal fibers for each square centimeter of emitter surface area. The metal fibers are normally less than one micron in diameter and are uniformly embedded within an oxide insulator for emitting electrons from the ends of the metal fibers.

3,745,403

## DIRECT HEATING CATHODE STRUCTURE FOR ELECTRON TUBES

Akira Misumi, Mobara-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1971, Ser. No. 203,386
Int. Cl. H01j 1/15, 19/06
U.S. Cl. 313—341 10 Claims




A direct heating cathode structure for electron tubes, which has a low electrical conductivity cermet layer, an intermediate metal layer of a material capable of promoting the electron emission of electron emissive materials and an electron emissive material layer successively laminated on a cathode body of a high resistivity alloy. The cermet layer in this cathode structure provides improved heat generating effect of heater current on the cathode body, permits passage of adequate current into the intermediate metal layer and electron emissive material layer, and prolongs the service life of the cathode.

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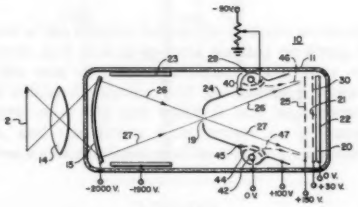
3,745,404

## IMAGING TUBE WITH SENSITIVITY THRESHOLD

Munsey E. Crost, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 838,283, July 1, 1969, abandoned. This application July 23, 1971, Ser. No. 165,718
Int. Cl. H01j 31/48
U.S. Cl. 315—11 6 Claims




An electron imaging device which is capable of recognizing, on an instantaneous basis, only those regions of a two-dimensional optical image having a light-intensity exceeding a preselected threshold and which is insensitive to regions of light-intensity less than said threshold.

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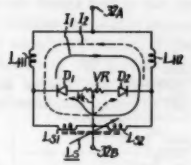
3,745,405

## MISCONVERGENCE COMPENSATING DEVICE FOR COLOR CATHODE RAY TUBES

Yuzo Fuse, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 12, 1971, Ser. No. 114,982
Claims priority, application Japan, Feb. 28, 1970, 45/19742
Int. Cl. H01j 29/50
U.S. Cl. 315—13 CG 11 Claims

In a color cathode ray tube comprising a color screen having arrays of different color phosphors, beam selecting means provided with passages corresponding to the arrays of color phosphors, plural-beam generating means for directing a plurality of electron beams in a common plane toward the screen for impingement on respective phosphors of the arrays through the corresponding passages, and a deflecting means for causing the plurality of electron beams to scan on the screen and including a pair of deflection coil means connected in parallel to each other for generating nonuniform magnetic fields; misconvergence of the beams is corrected by a device including variable impedance means connected in series to at least one of the deflection coil means for adjustably controlling the magnetic field produced thereby.

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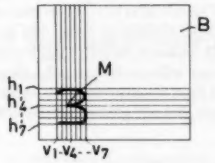
3,745,406

## METHOD AND DEVICE FOR STANDARDIZING SIZE AND POSITION OF PICTURES

Adrianus Johannes Wilhelmus Marie Van Overbeek, and Leendert Gerardus Krul, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,471
Claims priority, application Netherlands, Jan. 8, 1970, 7000190
Int. Cl. H01j 29/70
U.S. Cl. 315—25 1 Claim




Method and device for standardizing the size and position of pictures on an image screen, the extreme boundaries of a picture being determined and employed in the form of voltages for feeding a set of potentiometers, at the tappings of which voltages are produced, which represent a division of the picture between said boundaries. These voltages are compared with a sawtooth voltage synchronous with the image frequency or with the image line frequency; in the event of equality with said sawtooth voltage time pulses are obtained, which are capable of controlling gates which pass for further processing data of the picture regardless of its size and position. The device for carrying out said method may be an analogue, a digital or an analogue-digital device (Figs. 2, 6).

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3,745,407

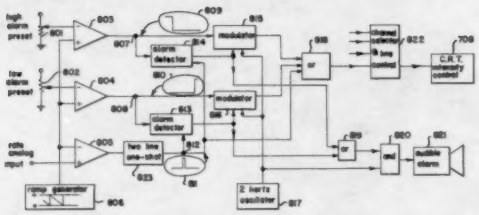
## DIGITAL CATHODE RAY TUBE INTENSITY-MODULATOR

Christopher C. Day, Newtonville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 9, 1970, Ser. No. 87,714
Int. Cl. H01j 29/52
U.S. Cl. 315—30 10 Claims

A digital cathode ray tube intensity-modulator. A digital intensity-modulator is disclosed for use in diaplay systems utiliz-

ing a cathode ray tube wherein at least one coordinate along the tube face defines a field of binarys. The modulator includes circuitry for providing binary numbers that represent instantaneous values of amplitude of input analog signals and further includes a device for intensity modulating the beam



when it impinges at points on the tube face defined by the binary numbers. A trace enhancement device utilizing the above circuitry and a cathode ray tube meter with high and low limits are disclosed. The intensity modulator is applicable to many analog display systems and is particularly applicable to systems for displaying vital sign signals of a patient.

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**3,745,408**

**INTELLIGENCE TRANSDUCING BEAM MODULATION METHOD AND APPARATUS**

**Lawrence D. Emmons, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Feb. 20, 1969, Ser. No. 800,990**

**Int. Cl. H01j *29/52***

**U.S. Cl. 315—30** **13 Claims**

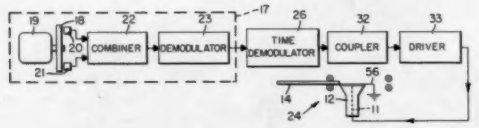


Image intelligence signals to be transduced for display are converted to a pulse width modulated signal including pulses whose widths are varied in accordance with the image intelligence signal strength. The pulse width modulated image intelligence signal is coupled to switch a transducing beam between selected high and low intensity levels at the rate of the pulse width modulated image intelligence signal. The transducing beam is maintained at one of the selected intensity levels for the duration of the width of the pulses and at the other level for the interval between consecutive pulses.

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**3,745,409**

**COMBINATION OF A LOW-PRESSURE MERCURY VAPOUR DISCHARGE LAMP AND A GLOW DISCHARGE STARTER**

**Adriaan Netten, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

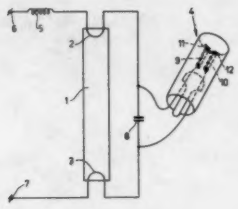
**Filed Nov. 10, 1971, Ser. No. 197,389**

**Claims priority, application Netherlands, Nov. 21, 1970, 7017065**

**Int. Cl. H05b *41/08***

**U.S. Cl. 315—100** **4 Claims**

In the combination of a low-pressure mercury vapour discharge lamp with a glow discharge starter, such combination can be made to start high voltage lamps (i.e. more than 150 volts). This is effected by the use of a filler gas for the starter comprising at least 60 percent by volume of hydrogen. In a preferred embodiment, the filler gas comprises approxi-



mately 70 percent by volume of hydrogen gas and 30 percent by volume of neon, the pressure of the filler gas being approximately 20 Torr.

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**3,745,410**

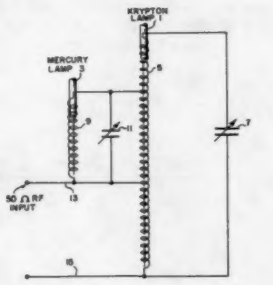
**DRIVING LAMPS BY INDUCTION**

**James C. Fletcher, Administrator of the National Aeronautics & Space Administration with respect to an invention of; Helmuth H. Laue, Escondido, and Leonard G. Clough, Poway, both of Calif.**

**Filed Mar. 16, 1972, Ser. No. 235,269**

**Int. Cl. H05b *41/16***

**U.S. Cl. 315—248** **4 Claims**




An electrodeless lamp circuit with a coil surrounding a krypton lamp driven by an RF input source tapped across an end part of the coil and with a coil surrounding a mercury lamp tapped across the connection of the input central to the krypton-lamp coil and a point of the krypton-lamp coil electrically away from both input connections. Each coil is connected in parallel with separate capacitors which form resonant circuits at the input frequency.

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**3,745,411**

**CURRENT SUPPLY DEVICE FOR A GAS-AND/OR VAPOUR DISCHARGE LAMP**

**Jan Polman, and Jan Evert Van Der Were, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 3, 1970, Ser. No. 86,471**

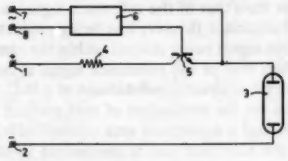
**Claims priority, application Netherlands, Nov. 10, 1969, 6916934**

**Int. Cl. H05b *37/02***

**U.S. Cl. 315—209 R** **6 Claims**

The invention relates to a device for supplying an intermittent current to a gas- and/or vapour discharge lamp.

According to the invention an intermittent current is used in which the effective period is considerably shorter than the subsequent rest interval, whilst the pressure in the discharge space of the lamp is chosen to be comparatively high. This combination of a short effective period and a high pressure



together with an appropriate choice of the frequency provides on the one hand a high light output of the lamp and on the other hand a long lifetime thereof.

The potential increases in luminous efficiency provided by the invention is considerable.

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**ERRATUM**

For Class 317—99 see:
Patent No. 3,745,399

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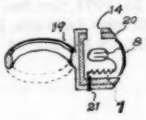
**3,745,412**
**ELECTROSTATIC DISCHARGE DEVICE**

**John Denis Ruff, 206 Birch St., Alexandria, Va.**

**Filed Nov. 19, 1971, Ser. No. 200,527**
**Int. Cl. H05f 3/00**
**U.S. Cl. 317—2 R** **1 Claim**



A device which enables the user to dissipate an electrostatic charge, such as is picked up from walking on a rug, by controlling the rate of discharge through a resistor which is mounted within the device, and the device is worn on the user's finger as a ring and which is thus kept conveniently available, and the device incorporates an indicator lamp which gives a visual indication of the charge dissipation.

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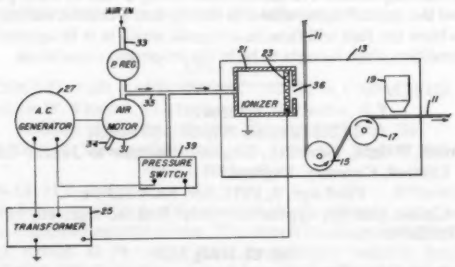
**3,745,413**
**IONIZING APPARATUS**

**Thomas C. Whitmore, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 63,140, Aug. 12, 1970. This application Dec. 16, 1971, Ser. No. 208,970**
**Int. Cl. H05f 3/06**
**U.S. Cl. 317—4** **4 Claims**




In apparatus for generating and applying ionic charges to a web of film or the like operating in an explosive atmosphere of solvent vapor comprising an ionizer, a source of electrical energy connected to the ionizer, and means for supplying a stream of gas to the ionizer, the improvement comprising an air motor driving an electrical generator for supplying energy to the ionizer, and a single source of air under pressure connected both to the air motor and to the ionizer. Upon failure of air supply to the ionizer the motor automatically stops so as to discontinue the supply of electrical energy to the ionizer and avoid an explosion of the solvent vapor. Additionally a pressure responsive switch acts to open the circuit to the ionizer if the gas pressure decreases in the conduit leading to the ionizer.

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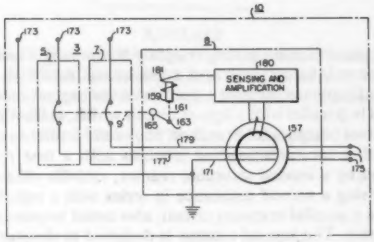
**3,745,414**
**GROUND FAULT CIRCUIT INTERRUPTER**

**Edsel W. Frantti, Pittsburgh, Pa., and Francis L. Gelzheiser, Fairfield, Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Jan. 21, 1972, Ser. No. 219,710**
**Int. Cl. H02h 3/28**
**U.S. Cl. 317—18 D** **11 Claims**




A ground fault circuit interrupter for use between line terminals and load terminals in a load center enclosure for one or more circuit breakers of any current rating in which a ground fault interrupter is provided in conjunction with and in side-by-side relationship with a circuit breaker; the circuit breaker having a trip member for automatically opening the contacts of the circuit breaker, and the ground fault interrupter having means for mechanically actuating the trip member in response to a ground fault.

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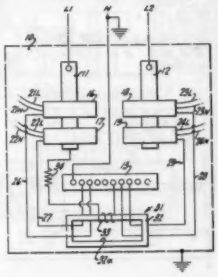
**3,745,415**
**CIRCUIT BREAKER PANELBOARD WITH GROUNDED NEUTRAL PROTECTION**

**Bruce T. Polley, Vallejo, and Wallace W. Wahlgren, Oakland, both of Calif., assignors to The Rucker Company, Oakland, Calif.**

**Filed Oct. 24, 1972, Ser. No. 299,816**
**Int. Cl. H02h 3/28**
**U.S. Cl. 317—18 D** **10 Claims**



Circuit breaker panelboard assembly in which each breaker includes ground fault responsive means, and means is pro-

vided externally of the breakers for preventing the ground fault responsive means for being rendered ineffective by grounding of the neutral conductor in one of the branch circuits served by the panelboard assembly.

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**3,745,416**

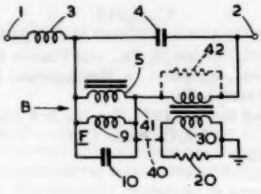
**A. C. POWER SYSTEM COUPLINGS**

**Hemesh Laxmidas Thanawala, Stafford, England, assignor to Associated Electrical Industries Limited, London, England**

**Filed July 2, 1971, Ser. No. 159,375**

**Int. Cl. H02h** *9/00*

**U.S. Cl. 317—20** **9 Claims**




In a short-circuit limiting coupling comprising a series combination of inductance and capacitance tuned to power-system frequency, at least a portion of the capacitance is connected in parallel with a bypass circuit which, at least in effect, comprises two parallel branches, one of the branches comprising a first saturable reactor in series with a first resistance shunted by a second saturable reactor, and the other branch comprising a second resistance in series with a rejector filter such as a parallel resonant circuit, also tuned to power-system frequency. The second reactor is designed to desaturate at a somewhat higher current level than the first; the first resistance will therefore assist in the recovery of the first reactor. The second resistance will damp harmonic and, more importantly, sub-harmonic oscillations.

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**3,745,417**

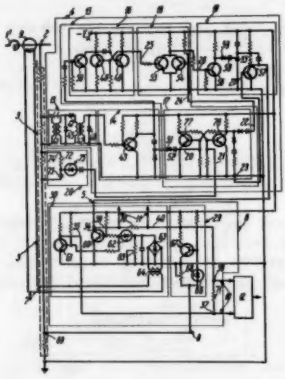
**METHOD OF PROTECTION OF D.C. TRANSMISSION LINES AND A DEVICE FOR ACCOMPLISHING SAME**

**Vasily Makarovich Maranchak, Lefortovsky val, 716, korpus 9, kv. 12; Vladimir Nikolaevich Novella, Utrennyaga ul. 10, korpus 2, kv. 43, and Stanislav Petrovich Veisky, ul. Lobanova 4 kv. 36, all of Moscow, U.S.S.R.**

**Continuation-in-part of Ser. No. 29,605, April 17, 1970, abandoned. This application Sept. 7, 1972, Ser. No. 287,078**

**Int. Cl. H02w** *3/00*

**U.S. Cl. 317—31** **2 Claims**



A method of protecting D.C. transmission lines, based on shaping a signal proportional to a time derivative of the varying voltage on a line being protected. A reference signal of a preset duration is produced at the moment of emergence of the signal being shaped, the duration of said shaped signal being compared against the duration of the reference signal within a time interval until said derivative changes its sign. The duration of the signal being shaped within the preset time interval smaller than that of the reference signal is indicative of a likely short-circuit in the very line being protected, while the duration of the signal being shaped within the same time interval longer than that of the reference signal is indicative of a likely fault at the convertor substations of a D.C. transmission line. A device for the realization of said method comprises: a selection unit and a protection unit controlled by the former; an input of the selection unit is connected to the line being protected via a voltage divider, an output of said selection unit being, at the same time, one of the inputs of the protection unit; the rest of the inputs of said protection unit are connected to the D.C. line under protection via a D.C. transformer and the voltage divider, correspondingly. The selection unit is fashioned as series-connected differentiator for shaping a signal proportional to the time derivative of the voltage in the beginning of the very protected line, an amplifier and a pulse maximum duration selector, while the protection unit comprises: a minimum voltage member, a maximum current member and three logical circuits: one is the so-called " prohibitive" and the other two "matching" circuits.

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**3,745,418**

**CONTROL OF OPERATION OF A SYSTEM**

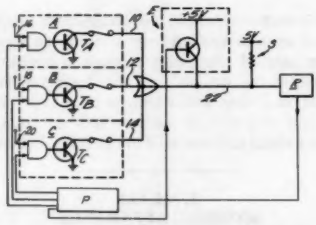
**Norman William McLeod, Glen Iris, Australia, assignor to The Commonwealth of Australia, Melbourne, Victoria, Australia**

**Filed July 28, 1971, Ser. No. 166,819**

**Claims priority, application Australia, July 30, 1970, 2035**

**Int. Cl. H02h** *5/04*

**U.S. Cl. 317—40 A** **10 Claims**



A system comprising a plurality of signal paths each of which has an operative condition in which it can carry a signal and an inoperative condition in which it cannot, and a control which is normally capable of placing each or any of said paths in the inoperative condition, there being a fuse in each path and the control being above to ensure that a current sufficient to blow the fuse will flow on any path which is in its operative condition when it ought to be in the inoperative condition.

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**3,745,419**

**ELECTRICAL WIRING SYSTEM**

**Frank Wright, Coventry, England, assignor to Jaguar Cars Limited, Coventry, England**

**Filed Apr. 9, 1971, Ser. No. 132,814**

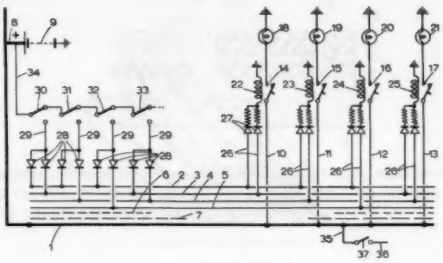
**Claims priority, application Great Britain, Apr. 10, 1970, 17,053/70**

**Int. Cl. H02g** *3/00*

**U.S. Cl. 317—137** **6 Claims**

A motor vehicle electrical system includes a ring main for supplying power to the various loads and also a plurality of

signal lines which are connectable in unique pairs to the vehicle battery in order to energize control devices associated with



the loads so that energization of a particular control device causes power to be supplied to the associated loads from the ring main.

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**3,745,420**

**CIRCUIT ARRANGEMENT FOR THE ACCURATE ADJUSTMENT OF ELECTROMAGNETIC ADJUSTING ELEMENTS AS A FUNCTION OF A D.C. VOLTAGE**

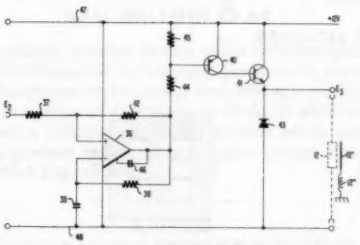
**Gunther Hafner, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany**

**Filed Apr. 25, 1972, Ser. No. 247,334**

**Claims priority, application Germany, Apr. 26, 1971, P 21 20 458.0**

**Int. Cl. H01h** *47/32*

**U.S. Cl. 317—146** **15 Claims**



A circuit arrangement for accurately positioning and adjusting an electromagnetic actuating member as a function of a d.c. voltage, in which the d.c. voltage is chopped into a rectangular pulse voltage with constant amplitude as well as with variable pulse spacing and variable pulse width such that the average value of the pulse voltage is equal to the d.c. voltage; the pulse voltage thus obtained acts on an adjusting member opposite a prestress engaging at this adjusting member.

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**3,745,421**

**CIRCUIT FOR RAPID CHARGING OF A CAPACITOR**

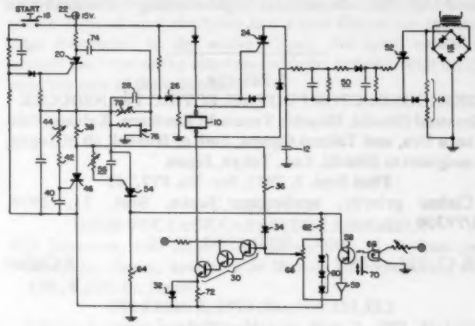
**Andrew W. Vincent, 65 Aberdeen St., Rochester, N.Y.**

**Division of Ser. No. 143,386, May 14, 1971, Pat. No. 3,706,011. This application Mar. 9, 1972, Ser. No. 237,214**

**Int. Cl. H01h** *47/32*

**U.S. Cl. 317—148.5 B** **2 Claims**

A drive circuit for rapid energization of a solenoid, relay, or other electromagnetic device. The circuit develops a relatively high voltage at its output for a controllably variable, brief period to initiate motion of the driven device. This is followed by a brief interval during which current through the device is effectively cut off, and thereafter a relatively low holding voltage is developed to maintain the device partly or fully energized. Servo means are provided for sensing the advance of



the device and for controlling the holding voltage to keep the device at a predetermined position for as long as desired.

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**3,745,422**

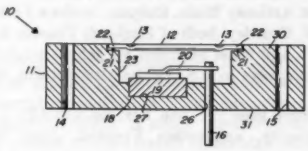
**POWER SEMI-CONDUCTOR DEVICE MOUNTABLE ON EITHER ITS TOP OR BOTTOM SURFACE**

**Robert A. Carnes, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 7, 1972, Ser. No. 232,489**

**Int. Cl. H01l** *3/00, 5/00*

**U.S. Cl. 317—234 R** **4 Claims**



A metal package, suitable for housing power transistors and other power semiconductors is disclosed. The metal package is fabricated to transfer heat from the transistor to either a top surface or to a bottom surface enabling the mounting of the package containing the power transistor or power semiconductor to a mounting surface adjacent either the top or the bottom thereof.

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**3,745,423**

**OPTICAL SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME**

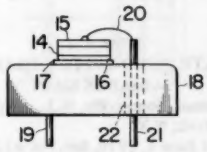
**Kasano, Hiroyuki, Akishima-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 27, 1971, Ser. No. 212,430**

**Claims priority, application Japan, Dec. 25, 1970, 45/130686**

**Int. Cl. H05b** *33/00*

**U.S. Cl. 317—234 R** **11 Claims**



Light-emitting semiconductor devices consist of a crystal having a Ge concentration of less than 1 ppm and a p-n junc-

tion and the method of manufacturing the same The light-emitting semiconductor device has emission peaks at 1.57 eV in a visible band and can be manufactured inexpensively compared to the coventional light-emitting semiconductor devices.

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**3,745,424**

**SEMICONDUCTOR PHOTOELECTRIC TRANSDUCER**

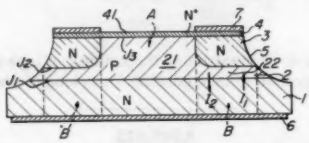
**Hirobumi Ohuchi, Hitachi; Yasutoshi Kurihara, Katsuta; Mitsuru Ura, and Takuzo Ogawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sept. 3, 1971, Ser. No. 177,742**

**Claims priority, application Japan, Sept. 11, 1970, 45/79300**

**Int. Cl. H01l** *15/00, 19/00*

**U.S. Cl. 317—235 R** **8 Claims**



A semiconductor photoelectric transducer comprising a unitary structure of an avalanche photo-diode and an amplifying transistor.

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**3,745,425**

**SEMICONDUCTOR DEVICES**

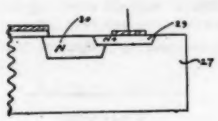
**Julian Robert Anthony Beale, Reigate; Andrew Francis Beer, Pound Hill, Crawley, both of England; Thomas Klein, Palo Alto, Calif., and Nigel Malcolm St. John Murphy, Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed June 17, 1966, Ser. No. 558,427**

**Claims priority, application England, June 18, 1965, 25,874/65**

**Int. Cl. H01l** *11/14*

**U.S. Cl. 317—235 R** **4 Claims**



An insulated gate field effect device comprising opposite conductivity type source and drain electrodes in a one-type substrate, forming source and drain P-N junctions. The drain P-N junction is back-biased forming a depletion layer extending into the substrate. To diminish the width of the depletion layer, an additional zone of the same conductivity type as the drain but of higher resistivity is provided contiguous with the drain offering the advantages of low capacitance and low depletion layer width as a function of voltage.

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**3,745,426**

**INSULATED GATE FIELD-EFFECT TRANSISTOR WITH VARIABLE GAIN**

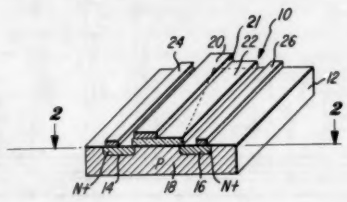
**John Aaron Olmstead, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed June 1, 1970, Ser. No. 41,867**

**Int. Cl. H01l** *11/00*

**U.S. Cl. 317—235 R** **10 Claims**

An insulated gate field-effect transistor comprising a source and drain which define the ends of a plurality of current carrying paths of controllable conductivity, and a gate separated from the current paths by an insulator. The width of the gate is less than the length of some of the current paths below it and is spaced from the drain in a direction parallel to the current



paths with a spacing that varies along the length of the drain; and, therefore, different drain voltages are required to achieve conduction along different ones of the current-carrying paths for any given gate voltage. This permits varying the drain voltage to achieve a variable gain.

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**3,745,427**

**SEMICONDUCTOR DEVICE OF P-TYPE ALLOYS**

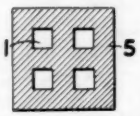
**Cyril Hilsum, Malvern, and Huw David Rees, Malvern Link, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Whitehall, London, England**

**Continuation of Ser. No. 874,004, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 792,027, Jan. 17, 1969, abandoned. This application Mar. 30, 1972, Ser. No. 239,586**

**Claims priority, application Great Britain, Nov. 7, 1968, 52,759/68**

**Int. Cl. H01l** *11/00, 15/00*

**U.S. Cl. 317—235 R** **2 Claims**



A semiconductor material having the composition $InP_xAs_{1-x}$ where $x$ denotes the atomic fraction of phosphorus and lies between 0.16 and 0.65 or $In_{1-y}Ga_yAs$ where $y$ denotes the atomic fraction of gallium and lies between 0.15 and 0.43. The material may be used as a basis for a Rees diode, in which a body of extrinsic semiconductor material of the conductivity type in which the minority carriers produce avalanche multiplication at lower electric field strengths than do the majority carriers has formed on it a first heavily doped electrode of the same conductivity type as the body and a second heavily doped electrode.

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**3,745,428**

**SEMICONDUCTOR DEVICE HAVING A COMPOSITE FILM AS A PASSIVATING FILM**

**Yutaka Misawa; Takuzo Ogawa, and Hideyuki Yagi, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 1, 1971, Ser. No. 111,267**

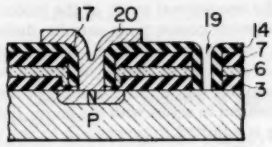
**Claims priority, application Japan, Jan. 30, 1970, 45/7715**

**Int. Cl. H01l** *7/00*

**U.S. Cl. 317—235 R** **3 Claims**

A semiconductor device having a composite film as a passivating film formed on the surface of the device in the order

of films of silicon oxide formed by thermal oxidation, phosphorous glass, silicon oxide formed by chemical vapor




deposition and silicon nitride, whereby cracks, which occurs in the film when the phosphorous glass film is in contact with the silicon nitride film, can be eliminated.

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**3,745,429**

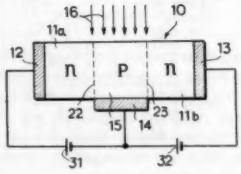
## CONTROLLABLE JUNCTION DEVICE AND RADIATION-GENERATING METHOD OF UTILIZING IT

**Yasuo Fujishiro, Suginami-ku, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 128,137, March 25, 1971, which is a continuation of Ser. No. 786,719, Dec. 24, 1968. This application June 23, 1971, Ser. No. 156,117**

**Int. Cl. H01l *15/00***

**U.S. Cl. 317—235 R** **12 Claims**




A controllable junction device and a radiation-generating method of utilizing said device; more particularly, a controllable junction device which usually functions as a resistor but is also able to operate as a transistor or diode. In addition, there is disclosed a radiation-generating method which uses such device to produce radiations of a higher energy than radiations to which it is exposed.

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**3,745,430**

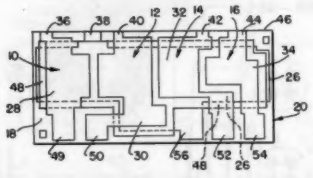
## THICK FILM FEED-THROUGH CAPACITOR

**Richard E. Lunquist, Pompano Beach, and William J. Kerr, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Franklin Park, Ill.**

**Filed Dec. 21, 1971, Ser. No. 210,536**

**Int. Cl. H01g *1/00***

**U.S. Cl. 317—256** **12 Claims**




A feed-through capacitor deposited in a thick film on a flat, thin alumina substrate having an active circuit and a capacitor. The capacitor includes a bottom electrode of metallized film on the surface of the substrate, a layer of dielectric having a high-dielectric constant, and a top electrode of metallized film deposited on the dielectric. The bottom electrode film has a terminal portion for connection to ground reference potential and a lead film connected to the active circuit, the same extending around the edge of the substrate with the active circuit on the opposite side thereof. The top electrode film may be singular or multiple in nature, having an external terminal at one edge of each electrode and a lead film at the opposite edge connected to the active circuit, the same extending around the edge of the substrate with the active circuit on the opposite side of the substrate.

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**3,745,431**

## HIGH VOLTAGE CAPACITOR ASSEMBLY

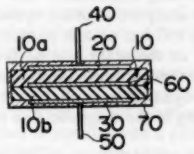
**Eiji Imamura, and Hajime Arakawa, both of Otokuni-gun, Kyoto-fu, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan**

**Filed Mar. 2, 1972, Ser. No. 231,183**

**Claims priority, application Japan, Mar. 2, 1971, 46/13180; Mar. 2, 1971, 46/13181**

**Int. Cl. H01g *1/13***

**U.S. Cl. 317—258** **23 Claims**




A high voltage capacitor assembly includes a ceramic body formed with a plurality of ceramic elements and embedded with interior electrodes which act to reduce the uneven potential distribution, which is often concentrated around the periphery of each of the exterior electrodes provided on both end faces of the ceramic body, thereby providing a capacitor assembly with an improved breakdown voltage characteristic.

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**3,745,432**

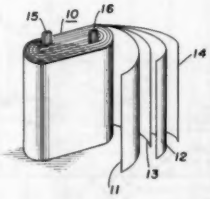
## IMPREGNATED CAPACITOR

**Ralph H. Munch, Webster Groves, Mo., and Quentin E. Thompson, Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Apr. 28, 1972, Ser. No. 248,671**

**Int. Cl. H01g *3/195***

**U.S. Cl. 317—259** **3 Claims**




Electrical capacitors are impregnated with liquid dielectric compositions comprising mixed halogenated aliphatic-aromatic ethers.

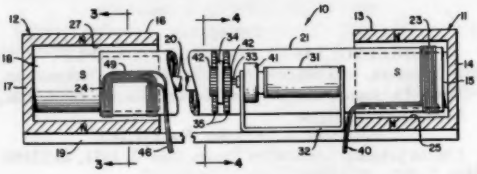
## 3,745,433
## ROTARY & LINEAR MAGNETOMOTIVE POSITIONING MECHANISM

**Edward Kelby, Jr., Schaumberg, and Alan G. Wallskog, Prospect Heights, both of Ill., assignors to Teletype Corporation, Skokie, Ill.**

**Continuation-in-part of Ser. No. 754,427, Aug. 21, 1968, abandoned. This application Feb. 2, 1971, Ser. No. 112,001**

**Int. Cl. H02k** *41/00*

**U.S. Cl. 318—115** **4 Claims**



A positioning mechanism for moving a cylinder axially and rotationally is adapted for a printer which has a cylindrical type carrier on which the dies are arranged in intersecting rows and columns.

A first electrically conductive coil is coaxial with and mounted on one end portion of the cylinder. A second electrically conductive coil has an axis perpendicular to the axis of and is mounted on the other end portion of the cylinder. A pair of permanent magnets are positioned about opposite end portions of the cylinder such that each coil is disposed for magnetic coupling in the magnetic flux field of a corresponding magnet.

By selectively energizing the coils, magnetic effects are produced thereabout for coaction with the permanent magnetic flux fields simultaneously to drive the cylinder axially of and angularly about its axis. A feed back system for sensing the instantaneous longitudinal and angular positions of the cylinder is adapted simultaneously to provide electrical effects, whereby from any axial and angular conditions the cylinder can be driven to any other selected axial and angular conditions.

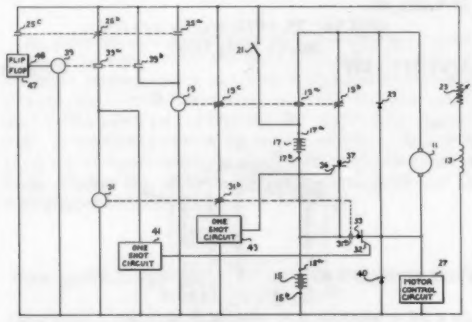
## 3,745,434
## MOTOR POWER AND CONTROL CIRCUIT

**Joe C. Lambert, Roanoke, and Sherrill G. Thomas, Goodview, both of Va., assignors to General Electric Company, Salem, Va.**

**Filed Dec. 29, 1971, Ser. No. 213,516**

**Int. Cl. B60l** *11/18*

**U.S. Cl. 318—139** **17 Claims**




A power and control circuit for utilizing the power generated by a shunt motor operating as a generator during coasting and braking. The circuit includes a switching arrangement to selectively effect connection of the motor armature with segments of a power storage device shown in the illustrated embodiment as a battery. Suitable circuitry including a bistable device capable upon each power application of sequencing its output to switch battery segment connections across the motor armature further includes switching devices to control the operational mode of the motor. The switching of battery segment connections permits, during coasting and braking, the charging of individual segments at a voltage level less than that required to charge the entire battery. There is provided means for regenerative braking of the motor through a resistive element in series with the motor field winding such that braking is adjusted in proportion to the value of the resistance.

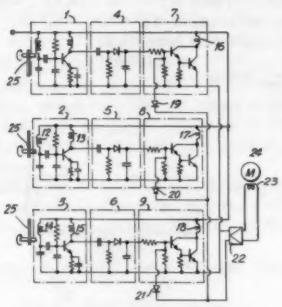
## 3,745,435
## DRIVING CIRCUIT FOR BRUSHLESS MOTOR

**Yoshikiyo Futagawa, and Chiaki Komatsu, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 16,178, March 3, 1970, abandoned. This application Oct. 4, 1971, Ser. No. 186,279**

**Int. Cl. H02k** *29/00*

**U.S. Cl. 318—254** **6 Claims**



A driving circuit for a brushless motor wherein each driving coil is energized in response to the receipt of a signal by a receiving coil from a transmitting coil. A continuously rotating slotted shield disk rotates synchronously with the rotor shaft of the motor for intermittently preventing the transmission of the signal from the transmitting coil to the receiving coil. A transmitting and receiving coil pair is provided for each driving coil.

## 3,745,436
## CONTINUOUS MODE MOTOR SPEED CONTROL SYSTEM

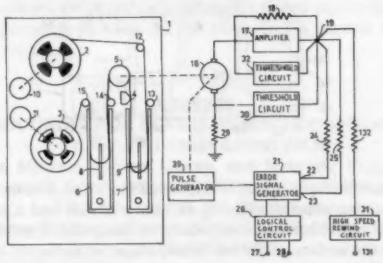
**Pietro Buttafava, Milano, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy**

**Filed Aug. 14, 1972, Ser. No. 280,702**

**Claims priority, application Italy, Aug. 26, 1971, 27871 A/71**

**Int. Cl. H02p** *5/06*

**U.S. Cl. 318—464** **2 Claims**




A control system for regulating low-inertia d.c. motors, such as employed in magnetic tape transports for data handling

systems, is provided, which employs a single regulator amplifier while the current regulating circuit includes a diode-resistor passive circuit having a precisely adjustable range of no response.

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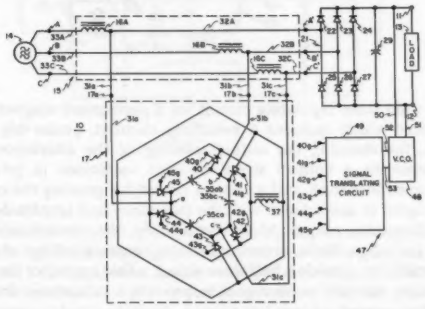
**3,745,437**

## REGULATOR CIRCUIT HAVING A MULTI-STEPPED REGULATING WAVE

**Harold J. Brown, Lorain, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio**

**Filed May 18, 1972, Ser. No. 254,697**
**Int. Cl. G05f 1/56, 1/68**
**U.S. Cl. 321—5** **13 Claims**




A circuit for providing a regulated a-c or d-c output voltage from an unregulated a-c input voltage. A series regulating network is disposed between the regulator input and the regulator output to support the difference between the unregulated input voltage and the regulated output voltage. A shunt regulating network is connected between the series regulating network and the regulator output to generate a plurality of regulating waves which, together with the input voltage, control the current through and voltage across the series regulating network. Output voltage sensing circuitry controls the phase angle between the input voltage and the regulating waves, as required, to establish and maintain the regulated output voltage.

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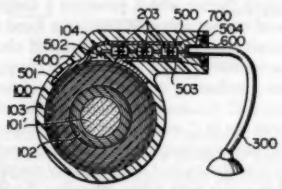
**3,745,438**

## HIGH VOLTAGE GENERATING DEVICE

**Taiichi Saeki, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed July 18, 1972, Ser. No. 272,949**
**Claims priority, application Japan, July 22, 1971, 46/65231**
**Int. Cl. H02m 7/00**
**U.S. Cl. 321—8 R** **10 Claims**




A high voltage generating device used to obtain a high voltage supplied to the television receiver picture tube anode, comprising a high voltage coil generating an a-c voltage and having an output terminal connected to one end of a rectifier means whose other end is connected to a high voltage lead line, wherein the high voltage coil and rectifier are molded together with a resin. Thus, it can be readily manufactured and will be small in size, light in weight and excellent in insulation character.

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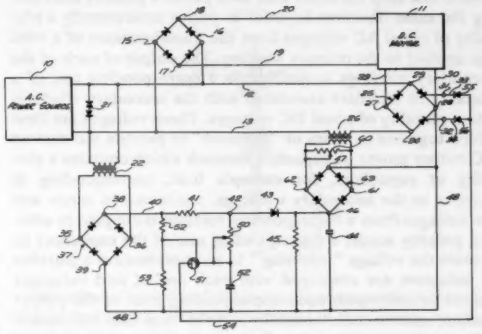
**3,745,439**

## D.C. MOTOR SPEED CONTROL

**Neal W. Belmuth, Great Neck, N.Y., assignor to Regent Machinery Corporation, Long Island City, N.Y.**

**Filed Aug. 7, 1972, Ser. No. 278,337**
**Int. Cl. H02m 7/20**
**U.S. Cl. 321—18** **8 Claims**



In a D.C. motor speed control, an A.C. power source is connected in series with the primary winding of a current transformer and a controlled rectifier whose output is connected to the armature of the D.C. motor. In addition, the A.C. power source is coupled, via a first full-wave rectifier, to the field winding of the motor, and via a voltage transformer to a second full-wave rectifier. The output winding of the current transformer is connected in parallel with a potentiometer and a third full-wave rectifier. The outputs of the second and third full-wave rectifiers are connected to pulse generating means whose output pulses are connected to the controlled rectifier so as to control the rectified D.C. voltage applied to the motor. When the A.C. source is turned on, the output of the second full-wave rectifier causes the output pulses of the pulse generating means to be decreasingly delayed, thereby causing the rectified voltage to the motor and the motor speed to increase slowly. If during the steady state operation of the motor its load is changed, the line current changes and the output of the third full-wave rectifier adjusts the timing of the pulses to provide a compensating change in the rectified voltage applied to the D.C. motor, thereby regulating the speed of the motor. Since the potentiometer controls the output voltage of the third full-wave rectifier for a given amount of line current, its setting determines the power delivered to the D.C. motor and its operating speed.

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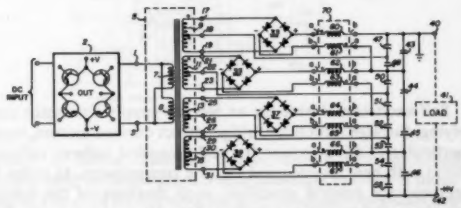
**3,745,440**

## ELECTRICAL INVERTER-RECTIFIER CIRCUIT AND INDUCTOR APPARATUS THEREFOR

**Harold Wilbur Lord, Mill Valley, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.**

**Filed Feb. 28, 1972, Ser. No. 229,819**
**Int. Cl. H02m 7/00**
**U.S. Cl. 321—26** **19 Claims**




The disclosed invention converts a square wave alternating voltage of relatively low voltage to a high direct voltage and is

used as part of a conventional DC to DC voltage converter such as is found in electronic inverter/rectified regulated voltage power supply systems. An input transformer contains a primary winding and a plurality of separate secondary windings, such as four in one example. Each of the secondary windings is a single layer and all have the same number of turns. The secondary windings are electrically isolated and are wound one atop the other with their positive polarity ends facing the same direction in order to derive concurrently a plurality of equal AC voltages from the transformation of a voltage applied to the primary winding. The output of each of the secondary windings is rectified in a corresponding one of a plurality of rectifiers associated with the secondary windings into a plurality of equal DC voltages. These voltages are then added together in series or "summed" to provide the desired DC output power. A capacitor network which contains a plurality of capacitors, for example four, corresponding in number to the secondary windings, connected in series and the voltages from a corresponding rectifier is coupled in additive polarity across a corresponding one of the capacitors to provide the voltage "summing". In an improvement a plurality of inductors are employed with each one of said inductors placed in series with each corresponding ones of the output leads of each rectifier assembly so as to form with the capacitors an L-C circuit and thereby minimize the ripple voltage of the output power to the load.

A novel multi-section inductor assembly having minimal distributed capacitance is utilized for said plurality of inductors and comprises a plurality of individual windings, divided into two groups each of which is insulated from one another, is of substantially equal number of turns, is of a single layer, is oriented with the windings in phase and wound upon a common nonsaturating magnetic core or lamination. Other than the first winding in one group and last winding in the second group the negative polarity ends of the winding in one group are connected electrically in common with the positive polarity ends of corresponding windings in the second group of windings.

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**3,745,441**

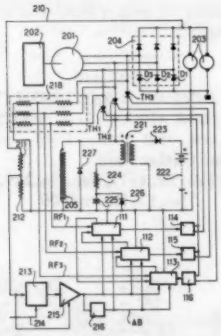
## SELF-EXCITATION DEVICE FOR AN ALTERNATOR

**Jacques Soffer, 43 rue Pasteur, 92 Sceaux, and Gilbert Vidal, Oree de Senart, 91 Draveil, both of France**

**Continuation-in-part of Ser. No. 125,254, March 17, 1971, abandoned. This application June 19, 1972, Ser. No. 264,325**

**Int. Cl. H02p 9/30**

**U.S. Cl. 322—20** **10 Claims**



Self-excitation device for an electric supply alternator supplying, through a rectifier bridge, direct current motors, more particularly, drive motors for self-propelled railway vehicles fitted with heat engines and electric transmission. In order to increase the control precision, each thyristor of the bridge supplying the excitation winding of the alternator is controlled by a control circuit which is synchronized with the help of a selection circuit, by one or the other of the voltages obtained between the outputs of the alternator and ground.

**3,745,442**

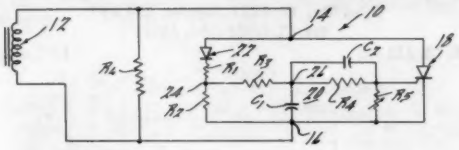
## VOLTAGE AND FREQUENCY RESPONSIVE REGULATING CIRCUIT FOR A PM GENERATOR

**George E. Gynn, Fort Wayne, Ind., assignor to Syncro Corporation, Oxford, Mich.**

**Filed Apr. 17, 1972, Ser. No. 244,778**

**Int. Cl. H02p 9/44**

**U.S. Cl. 322—24** **55 Claims**



A solid state regulating circuit for a permanent magnet alternator which includes a switching element, preferably an SCR, for shunting the output winding of the alternator in response to a control signal to limit variations in power delivered to a load, and a control circuit for proving the control signal in accordance with the frequency and amplitude of the alternator output. More particularly, the control circuit may include a diode connected to the output windings of the alternator to provide a half wave signal, a first capacitor for integrating the half wave signal to provide a monotonic intermediate signal of predetermined duration, and a second capacitor connecting the first capacitor and the gate of the SCR for providing the control signal for gating the SCR.

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**3,745,443**

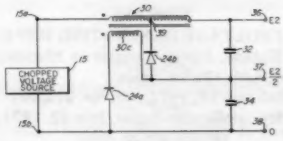
## POWER SUPPLIES WITH OUTPUT VOLTAGE TAPS FROM INPUT FILTER CHOKE

**Thomas A. Weil, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.**

**Filed Dec. 7, 1971, Ser. No. 205,590**

**Int. Cl. H02m 7/04**

**U.S. Cl. 323—DIG. 1** **4 Claims**

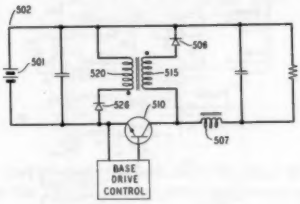



A power supply circuit which provides a simple means for obtaining several output voltages bearing a fixed ratio to each other. The circuit utilizes a multiple tapped choke which is connected to a source of D.C. voltage by a chopper or switch which provides a pulsating current at a repetition frequency greater than the L.C. resonant frequency of the choke and the filter capacitor at the D.C. output terminals. Several variations of the circuit are disclosed wherein the multiply-tapped choke, or equivalently several magnetically coupled windings, are connected in series with a free-wheeling diode which is always in the state of conduction except during the duration of an input pulse of current through the input chopper or switch so that there is always current in the inductive choke. Additional switching means such as a diode is connected from the taps on the choke to output terminals and is disposed to conduct during the free-wheeling period to extract the several output voltages, each bearing a fixed ratio to the other. To reduce output voltage ripple, capacitors are connected across the output taps to maintain the output voltages substantially constant during the entire cycle.

## 3,745,444
## SWITCHING REGULATOR WITH NETWORK TO REDUCE TURNON POWER LOSSES IN THE SWITCHING TRANSISTOR

**Edwin Theodore Calkin, Parsippany; Billy Harold Hamilton, Summit, and Frank Carl La Porta, Livingston, all of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.**

**Filed Mar. 22, 1972, Ser. No. 236,852**
**Int. Cl. H02m 3/32**
**U.S. Cl. 323—17** **3 Claims**




Power dissipation losses occur during the turnon transition period of the switching transistor of a switching regulator. These losses are due to the voltage appearing across the switching transistor during current conduction within the turnon transition period. A turnon loss reduction network is added to the switching regulator to reduce the power dissipation inthe switching transistor during turnon. This turnon loss reduction network counteracts the voltage normally appearing across the switching transistor and hence reduces the power dissipation therein due to this voltage. A lossless charging arrangement is included in the regulator to reduce the power dissipation that occurs within the turnon loss reduction network.

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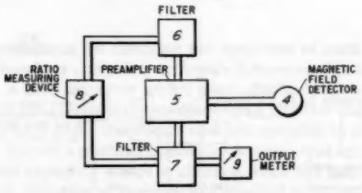
## 3,745,445
## MAGNETIC INDUCED POLARIZATION METHOD FOR GEOPHYSICAL PROSPECTING

**Harold Oscar Seigel, Willowdale, Ontario, Canada, assignor to Scintrex Limited, Concord, Ontario, Canada**

**Filed Nov. 23, 1970, Ser. No. 91,965**
**Int. Cl. G01v 3/06, 3/08**
**U.S. Cl. 324—1** **4 Claims**

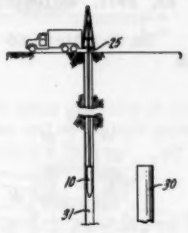



This application concerns a method of geophysical prospecting wherein one creates a polarized condition in the medium being explored by conductively passing primary electric currents of repetitive wave form through the medium at two distinct frequencies in the active induced polarization range which differ from each other by at least a factor of 2, maintaining the ratio of the electric current amplitudes of said wave forms at said distinct frequencies substantially constant, measures the magnitude of a magnetic field component primarily due to current flow in the medium at each of said distinct frequencies and comparing said magnitudes to obtain an indication of the presence of regions of anomalous induced polarization.

## 3,745,446
## MAGNETIC LOGGING METHOD OF LOCATING LOST WELLS

**William F. Norris, Tulsa, Okla., assignor to Seismograph Service Corporation, Tulsa, Okla.**

**Filed Mar. 13, 1972, Ser. No. 234,053**
**Int. Cl. G01v 3/08, 3/18**
**U.S. Cl. 324—3** **5 Claims**




The top of a buried well casing made of magnetic material is located by logging, in test holes drilled in the vicinity, vertical magnetic logs which show peak magnetic intensity at the depth of the well casing top and horizontal magnetic logs made with vertically spaced magnetometers whose outputs are subtracted to cancel out the effect of the earth's magnetic field and thus develop peak intensity horizontal lines which, from two or more test holes, intersect at the horizontal location of the well casing. The test holes are drilled and logged successively so as to pinpoint the location of the buried casing. Alternatively, the first derivative signal from the spaced magnetometers comprising the vertical log is scaled to indicate the horizontal distance from the first test hole to the well casing and the second hole is drilled at that distance along the peak intensity horizontal line of the horizontal log.

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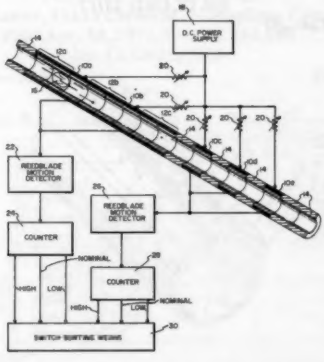
## 3,745,447
## CONTACTLESS TEST APPARATUS FOR DETERMINING THE SENSITIVITY OF REED SWITCHES

**Dale R. Jaster, Northlake, and James R. Quigley, Lombard, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.**

**Filed July 3, 1972, Ser. No. 268,368**
**Int. Cl. G01r 31/02**
**U.S. Cl. 324—28 RS** **13 Claims**




There is herein disclosed a reed switch test apparatus wherein reed switches are fed longitudinally through a linear array of test coils having selected flux densities. Operation and release of the reed switch contacts is electromagnetically sensed and output signals are produced to segregate reed switches into high, low and nominal sensitivity categories.

## 3,745,448

### TOROIDAL MAGNETOELASTIC TRANSDUCER FOR MEASURING MECHANICAL FORCES

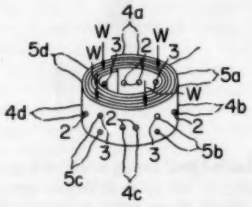
Michio Hiratsuka; Jiro Ishii; Koshi Hiwatashi; Toshiaki Mizoguchi; Yoshikazu Ogata; Makoto Ono, and Yoshiyuki Goto, all of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukuoka-ken, Japan

Filed Mar. 30, 1972, Ser. No. 239,562

Claims priority, application Japan, Mar. 30, 1971, 46/19897; Nov. 13, 1971, 46/106103; Nov. 22, 1971, 46/109331

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 R 8 Claims




A device for measuring rather heavy compressive loads applied axially on the annular flat surfaces of a wound type magnetic core, comprising, in addition to the wound type magnetic core, at least one active coil wound in a plane perpendicular to the axis of the magnetic core through a corresponding number of first holes bored radially in the magnetic core, at least one compensating coil wound in a plane parallel to the axis of the magnetic core through a corresponding number of second holes bored radially in the magnetic core at positions sufficiently separated from the first holes, means for applying a constant voltage to each of said active coils and compensating coils, and means for measuring a difference, caused by the application of a load to the magnetic core, between the currents flowing through the active and compensating coils.

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## 3,745,449

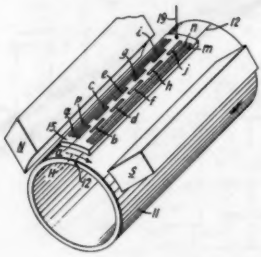
### METHOD AND APPARATUS FOR TESTING WELDED PIPE FOR ANOMALIES WITH MEANS TO CHANGE THE SENSITIVITY WHEN TESTING THE WELDED AREA

Eugene A. Placke, Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Dec. 1, 1971, Ser. No. 203,614

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 5 Claims




Apparatus and method for nondestructively inspecting a tubular member of uniform wall thickness having a weld line extending throughout its length. Complete circumferential inspection is continuously performed by apparatus that includes electronic circuitry which is caused to operate with greater sensitivity when inspecting zone in and ade weld line than when inspecting the remainder of the member.

## 3,745,450

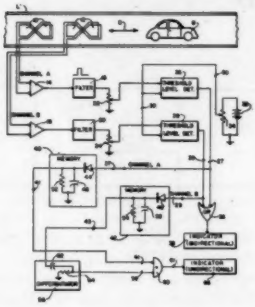
### METAL DETECTION SYSTEM FOR INDICATING THE MOTION AND DIRECTION OF MOTION OF A BODY HAVING MAGNETIC PROPERTIES

Marvin Duane Wilt, Dallas, Tex., assignor to Teledyne Industries, Inc., Dallas, Tex.

Filed Oct. 27, 1971, Ser. No. 192,822

Int. Cl. G01r *33/00*

U.S. Cl. 324—41 4 Claims



A passive-loop detector system responsive to disturbances of the magnetic fields cutting spaced detection loops when they are sequentially traversed by a body having magnetic properties, the system being operative to indicate motion thereof in either direction and also being operative to indicate motion of the body in only one selected direction, the system using electronic circuitry having separate signal channels connected with the spaced detection loops and these channels having different time-constants and having their outputs combined such that when the loop in the longer time-constant channel responds first, it can hold its output signal long enough for the shorter time constant channel to have its output ANDed therewith to provide an indication, but not vice-versa.

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## 3,745,451

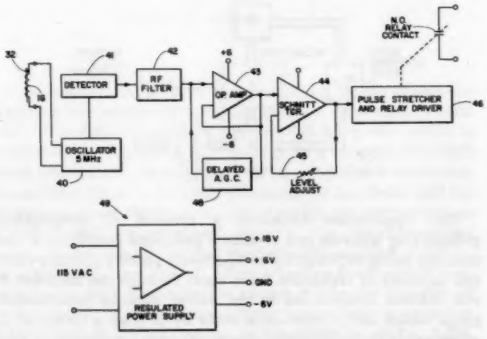
### SYSTEM FOR DETECTING FAULTS IN TWISTED WIRES BY SENSING VARIATIONS IN $\mu$

Fernand Goyette, Longueuil, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Mar. 6, 1972, Ser. No. 232,064

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 3 Claims



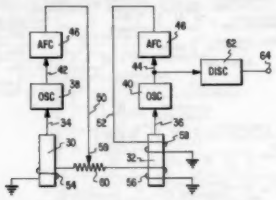

A detector for faults in twisted wires, the detector in the form of a coil or other sensing device positioned adjacent the twisted wires and sensitive to variations in the $\mu$ of the wires. The sensing device is connected to an amplifying and detecting circuit arranged to react to an abrupt change in the amplitude of the signal from the sensing device.

**3,745,452**

## MAGNETIC FIELD GRADIENT APPARATUS AND METHOD FOR DETECTING PIPE LINE CORROSION

**John D. Osburn, 5212 Berkman Drive, Austin, Tex., and Donald R. White, Route 2, Box 76, Springfield Drive, Darnestown, Md.**

**Filed Feb. 23, 1971, Ser. No. 118,033**
**Int. Cl. G01r *31/00, 31/12***
**U.S. Cl. 324—54** **7 Claims**



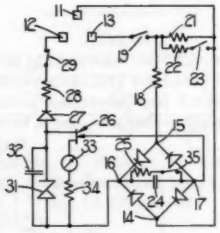

Electrical current patterns indicative of either the cathodic protection or the existence of external corrosion of a subsurface pipeline are detected by measuring the magnetic fields produced by electrical current flowing respectively into or exiting from the buried pipeline at the situs of a bare region of the pipeline at which corrosion may take place.

**3,745,453**

## INSTRUMENTS FOR CHECKING THE OPERATION OF EARTH LEAKAGE CIRCUIT BREAKERS

**Maurice James Wright, Quinton, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Apr. 27, 1971, Ser. No. 137,771**
**Claims priority, application Great Britain, May 2, 1970, 21,201/70**
**Int. Cl. G01r *31/02***
**U.S. Cl. 324—51** **7 Claims**




An instrument for checking the operation of earth leakage circuit breakers comprises terminals for connection to an a.c. circuit, a first capacitor which when the instrument is connected to the circuit is charged through a rectifier to provide a power source and a test switch which is operable to present to the a.c. circuit a predetermined live to earth leakage current. A second capacitor which is charged when the test switch is operated, charging of the second capacitor terminating when the circuit breaker being tested operates, provides an input to an amplifier powered by the first capacitor, and the amplifier operates warning means for giving the required indication.

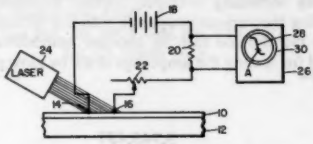
**3,745,454**

## METHOD AND MEANS FOR MEASURING CARRIER LIFETIME IN EPITAXIAL FILMS

**Roger G. Nikirk, Scottsdale, and Leo C. Rogers, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.**

**Continuation of Ser. No. 861,040, Sept. 25, 1969, abandoned.**
**This application Dec. 3, 1971, Ser. No. 204,698**
**Int. Cl. G01r *27/14***
**U.S. Cl. 324—64** **6 Claims**

To measure the lifetime of carriers in epitaxial film, contacts are made to the film by probes which are spaced from each other. A voltage is applied between the probes, and a light pulse is directed onto the film between the probes. The length of time that it takes the current flow through the layer



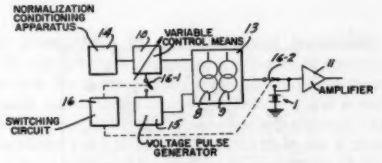

between the probes to decay to a value of $1/e$ of the maximum value thereof after the end of the light pulse is a measure of the lifetime of the carriers in the layer.

**3,745,455**

## CURRENT NORMALIZER FOR PARTICLE SIZE ANALYSIS APPARATUS

**Geoffrey T. Haigh, Lake Parsippany, N.J., assignor to Particle Data, Inc., Elmhurst, Ill.**

**Filed June 21, 1971, Ser. No. 154,859**
**Int. Cl. G01n *27/00***
**U.S. Cl. 324—71 CP** **10 Claims**



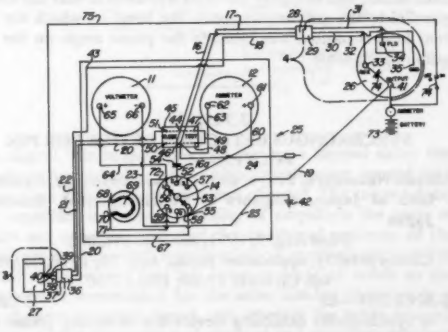

A current normalizer utilizes a pair of parallel, simultaneously programmed current generators to provide a DC current and a synthetic particle current pulse to an electric particle sensing zone for measuring the resistance of an electrolyte. The current normalizer also includes means for controlling the generation of current in response to the setting of an adjustable precision voltage source.

**3,745,456**

## APPARATUS FOR TESTING ALTERNATORS AND VOLTAGE REGULATORS

**Ronald D. Kahler, 11113 Carlile St., Northglenn, Colo.**

**Filed Apr. 24, 1972, Ser. No. 246,559**
**Int. Cl. G01r *15/12***
**U.S. Cl. 324—73 R** **10 Claims**



An apparatus for testing alternators, voltage regulators and their component parts in an electrical system has a plurality of couplings adapted for connection to the output, field and aux-

iliary terminals of an alternator and to the field and armature terminals of a voltage regulator and to ground. The couplings are adapted to be connected with a voltage metering circuit and an amperage metering circuit through circuit means preferably including multiple contact switching means for connecting the various couplings with the metering circuits to conduct the desired test. In another embodiment, means is provided for testing the amperage draw by glow plugs in diesel engines.

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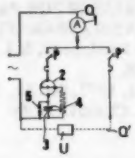
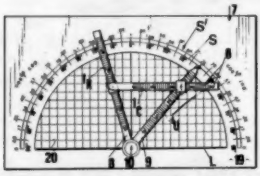
**3,745,457**

## PHASE METERS FOR THE INDIRECT MEASUREMENT OF POWER FACTOR

**Salvatore D'Avino, c/o Dr. Ing. Misitano A.G., via Padova, 217, 20127 Milan, Italy**

**Filed Oct. 8, 1971, Ser. No. 187,776**
**Int. Cl. G01n *25/00*; G06g *1/00***
**U.S. Cl. 324—83 R** **2 Claims**





The angle phase meter comprises a capacitor with a discharge resistor, an ammeter for measuring the current taken by the said capacitor, and the current taken by the load, and the current taken by the load and said capacitor when connected in parallel, a rule provided with a goniometric scale, two graduated hands independently pivoted at the centre of the goniometric scale and each provided with a slider indicating the corresponding graduation on the hand, a graduated listel provided with a slider and cooperating with the sliders of the said graduated hands, whereby the plotting by means of the listel and corresponding sliders the current taken by the load in the slider of one hand, the current taken by the load and capacitor in the slider of the other hand, and the current taken by the capacitor in the said listel by means of the listel slider, and swinging the hand and listel so that the listel is parallel to the goniometric base, the hand on which the current load is plotted will indicate the phase angle on the said goniometric scale.

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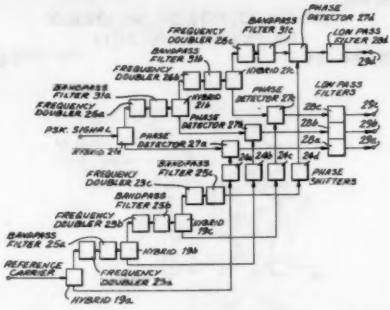
**3,745,458**

## SYNCHRONOUS DETECTING DEVICE FOR PSK POLYPHASE WAVE

**Hiroshi Nakamura, Tokyo, and Noriyasu Toyonaga, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 9, 1971, Ser. No. 170,085**
**Claims priority, application Japan, Aug. 10, 1970, 45/69877**
**Int. Cl. G01r *25/00*; H03d *3/00***
**U.S. Cl. 324—85** **5 Claims**

A synchronous detecting device for detecting phase shift keyed waves utilized in satellite communications and the like multiplies the PSK signals by 2 in a first plurality of multipliers and multiplies a plurality of reference carriers in a second plurality of multipliers. The multiplied signals are applied to a plurality of phase detectors. The PSK signals and the reference carriers are applied directly to another plurality of phase detectors. The phase detectors produce outputs proportional to the phase differences between the multiplied signals and the multiplied reference carriers whereby n phase detectors discriminate $2^n$ phases.

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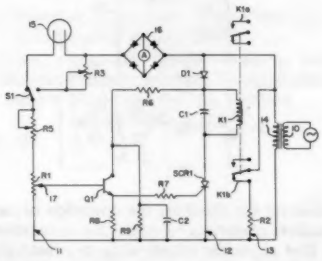
**3,745,459**

## CONDUCTIVITY MONITOR HAVING CONTROL NETWORK LOAD COMPENSATION

**George A. Cavigelli, Lexington, Mass., assignor to Sybron Corporation, Rochester, N.Y.**

**Filed Sept. 14, 1971, Ser. No. 180,329**
**Int. Cl. G01n *27/42***
**U.S. Cl. 324—157** **6 Claims**



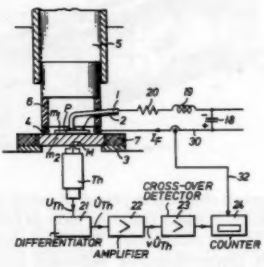

A conductivity monitor having a sensing network including a conductivity cell and an ammeter, and a control network including a relay which is energized when current in the sensing network exceeds a certain value, is provided with a load network connected in parallel to the sensing and control networks. The load network has an average impedance substantially equal to the average impedance of the control network and includes a switch operated by the relay that switches the load network from a conductive to a non-conductive state when the relay is energized. As a result the meter reading is not affected when the relay is energized.

The preferred control network has a capacitor wired in parallel with the relay between the cathode of a rectifier and the anode of an electronic switch. The impedance of this network varies cyclically and provides hysteresis for stable operation.

## 3,745,460
## METHOD AND APPARATUS FOR DETERMINING THE THERMAL INTERNAL RESISTANCE IN SEMICONDUCTORS OF THE SAME TYPE

Hans-Joachim Belzer, and Gerhard Kubitzki, both of Belecke, Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Germany

Filed Sept. 7, 1971, Ser. No. 178,189
Claims priority, application Germany, Sept. 7, 1970, P 20 44 225.5
Int. Cl. G01r *31/26*; G01n *25/00*
U.S. Cl. 324—158 T 10 Claims

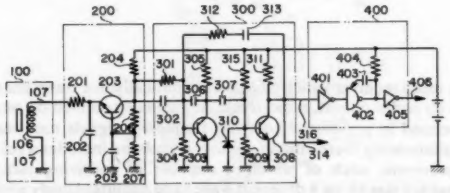



For determining the internal thermal resistance of a semiconductor wafer, an arrangement is provided in which a metal member supports the bottom of the wafer and a thermosensor contacts the underside of the member and monitors heat transfer from the wafer to the support member which is a function of the internal thermal resistance of the semiconductor. A current pulse is fed to the semiconductor causing heat to generate therein. The detected time interval between cessation of the pulse and detection of maximum heat transfer to the thermosensor leads to determination of the internal thermal resistance.

## 3,745,461
## DEVICE FOR MEASURING SPEED OF ROTATION INCLUDING A CIRCUIT FAILURE DETECTOR

Hisato Wakamatsu, Kariya-shi, and Tokuhiro Kurebayashi, Oobu-shi, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed May 5, 1972, Ser. No. 250,655
Claims priority, application Japan, May 6, 1971, 46/29970
Int. Cl. G01p *3/48*
U.S. Cl. 324—174 1 Claim

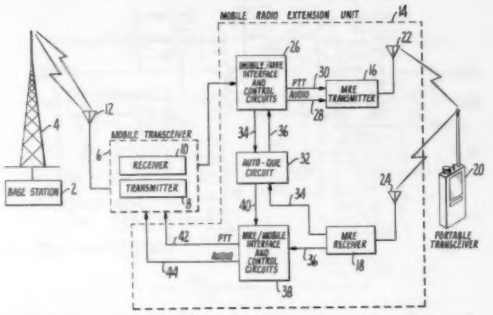


A device for measuring speed of rotation comprising an a.c. tachometer generator and an oscillator which oscillates in synchronism with the output of the generator when the generator is in operation and which oscillates at its free-running frequency when the generator is not in operation. In the device, means are provided for forcedly ceasing the oscillation of the oscillator in the event of occurrence of disconnection or short-circuit of the power generating coil of the generator, and a detector detects the de-energization of the oscillator.

## 3,745,462
## MOBILE RADIO EXTENSION INTERFACE FOR CONVERTING CONVENTIONAL TRANSMIT/RECEIVE TO A REPEATER

Melvin Earl Trimble, Saratoga, Calif., assignor to Public Systems Inc., Sunnyvale, Calif.

Filed Jan. 20, 1972, Ser. No. 219,247
Int. Cl. H04b *1/48*
U.S. Cl. 325—22 11 Claims

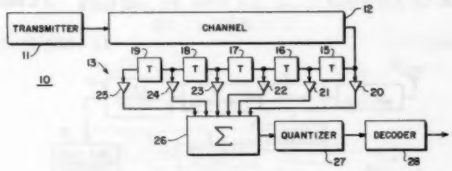



A unit connectable to a conventional transmitter and receiver to convert them for use as a repeater or transponder with provision for automatically inhibiting multiple transmissions by units within range of one another. The unit is particularly useful for using a mobile transceiver as a repeater to form communications links in both directions between a base station and a hand held portable unit in the proximity of the mobile transceiver.

## 3,745,463
## CODED EQUALIZER

Theodore J. Klein, Navesink, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed July 8, 1971, Ser. No. 160,671
Int. Cl. H04b *1/12*
U.S. Cl. 325—42 6 Claims

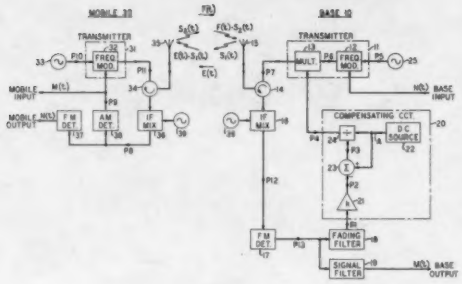



A digital information receiver having a tapped delay line equalizer for reducing intersymbol interference caused by a linear time dispersive transmission channel. The tapped delay line equalizer includes a plurality of amplifiers the gains of which are adjusted such that the combined response of the equalizer and channel approximates a multi-element coded digital signal which has the same number of levels as the signals to be transmitted, has the same number of elements as the channel response signal, and wherein the mean squared error between the combined channel and equalizer response signal and the channel response signal is a minimum. The output of the equalizer is connected to a decoder via a quantizer for decoding the transformed signal.

## 3,745,464
## RADIO SYSTEM WITH FEEDBACK FOR FADING COMPENSATION

William Chien-Yeh Lee, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Dec. 2, 1971, Ser. No. 204,014
Int. Cl. H04b 1/38
U.S. Cl. 325—62 10 Claims




A nondiversity radio system provides compensation for multipath fading by means of continuous amplitude feedback. Intelligence is transmitted from one station by means of frequency modulation, while amplitude modulation is caused by the fading en route. At the other station the received amplitude envelope is fed back as part of a frequency modulated, return intelligence signal. The feedback envelope is used at the first station to amplitude modulate the subsequent transmission to precompensate for the anticipated fade and produce fade-free reception at the other station. The system is especially well suited for mobile radio telephone applications since fading can be eliminated at a relatively simple, single branch mobile station.

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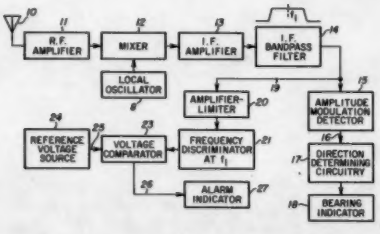
## 3,745,465
## DETECTOR OF FALSE VOR DIRECTION INDICATION

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Aug. 26, 1971, Ser. No. 175,113
Int. Cl. H04b 1/06
U.S. Cl. 325—363 3 Claims

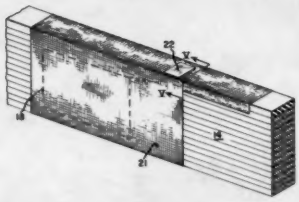



A monitoring means for detecting asymmetrical location of intermediate frequency bandpass filter output signal components in a VOR receiver to annunciate a mistuning condition which may give rise to false VOR bearing determinations. A frequency discriminator, at the IF bandpass filter center frequency, determines the general nature of the signal passing the filter, and the discriminator output, either AC or DC, is used to operate threshold sensitive alarm indication means.

## 3,745,466
## ELECTROSTATIC SHIELD ALLOWING SUBSTANTIALLY COMPLETE ELECTROMAGNETIC PROPAGATION FROM A TRANSMITTER

Alan D. Pisano, Revere, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 20, 1972, Ser. No. 219,246
Int. Cl. H04b 1/16
U.S. Cl. 325—119 10 Claims



A nickel mesh shield comprised of small closed loops surrounds a transmitter and radiating loop to provide an electrostatic shield for the transmitter. The mesh shield provides substantially no electromagnetic radiation attenuation of the radio frequency transmitted by the transmitter.

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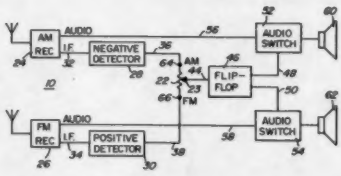
## 3,745,467
## MULTI-BAND RADIO RECEIVER

Robert L. Lundquist, Frankfort, and Charles J. Mathey, Arlington Heights, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 10, 1971, Ser. No. 179,389
Int. Cl. H04b 1/10
U.S. Cl. 325—304 9 Claims

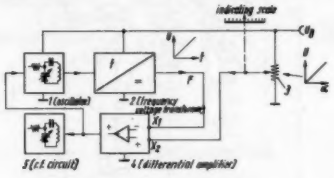



A radio receiver which selects automatically, for translation into an audio output, radio frequency signals received on one waveband in preferance to radio frequency signals received simultaneously therewith on another waveband includes a pair of receivers, each of which is capable of receiving radio frequency signals on a different waveband simultaneously with the other. A wave detector providing a positive output voltage is coupled to one of the receivers and a second wave detector providing a negative output is coupled to the other receiver. The output voltages provided by the detectors are proportional to the signal strengths of the radio frequency signals received by corresponding receivers. A potentiometer is coupled to the detectors and sums the voltages proportionally in accordance with the setting thereof. A bistable multivibrator senses the polarity of the resultant voltage and in accordance therewith operates one of two audio switches to pass audio signals from a corresponding receiver to an audio translator.

## 3,745,468
## CIRCUIT ARRANGEMENT FOR TUNING AND MECHANICAL DISPLAY OF THE TUNING FREQUENCY FOR HIGH FREQUENCY RECEIVERS WITH CAPACITIVE DIODE TUNING

Olaf Allner, Dresdner Str. 12, and Willy Kanow, Reichssportfeldstr. 16, both of Berlin, Germany

Filed Oct. 1, 1971, Ser. No. 188,680
Claims priority, application Germany, Oct. 14, 1970, P 20 51 415.2
Int. Cl. H03d 3/00
U.S. Cl. 325—455 6 Claims

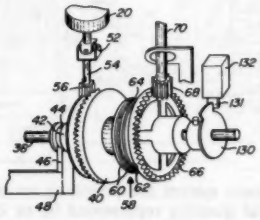


In a high frequency receiver circuit arrangement for tuning and for mechanical display of the tuning frequency for high frequency receivers operating with capacity diode tuning, in particular radio and television receiver sets, a DC voltage obtained from the receiver oscillator circuit containing the capacity diode by means of a converter or frequency DC voltage-transformer changing a frequency to a direct voltage is compared in a symmetrical direct voltage amplifier which is designed for instance as a differential amplifier with a second adjustable DC voltage. This latter voltage corresponds to the required frequency value tapped off from a potentiometer the setting of which is simultaneously displayed for example on a frequency scale. The output DC voltage of said DC amplifier is used for controlling the capacity diode of said oscillator circuit in order to assure an oscillator frequency value which corresponds to said given second DC voltage. An important feature consists in that said potentiometer and said frequency/DC voltage transformer are connected to the same terminal of the operating source.

## 3,745,469
## AUTOMATIC TUNING APPARATUS FOR A RADIO RECEIVER

Alfred J. Clark, Palatine, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 28, 1971, Ser. No. 157,159
Int. Cl. H04b 1/32
U.S. Cl. 325—471 6 Claims

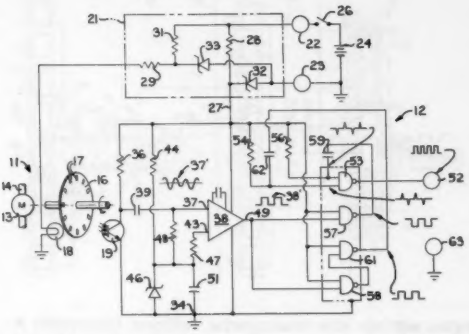


An automatic tuning assembly for a radio receiver includes a link arrangement having a pair of members joined together for movement with respect to each other and each being pivotal about a separate pivot point for coupling a drive motor to the rotatable tuner drive shaft of the receiver to vary automatically the frequency setting of the tuner assembly and simultaneously therewith for decoupling the manual tuning control knob, respectively. The members are pivoted in response to the actuation of a solenoid, the armature of which is connected to one of the joined members.

## 3,745,470
## PULSE TRANSMITTER CIRCUIT FOR MEASURING INSTRUMENTS

Russel W. Grob, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 28, 1971, Ser. No. 147,767
Int. Cl. H03k 5/00
U.S. Cl. 328—38 5 Claims

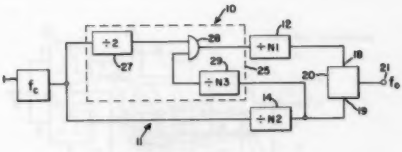


A compact, economically manufactured circuit for generating and transmitting pulses in response to predetermined increments of rotation of an element of a fluid flow meter has a photosensitive component detecting rotation of the meter element. Additional components, including an operational amplifier and logic gates, amplify and shape the signals from the photosensitive component and double the signal frequency to achieve a high pulse frequency capability, uniform pulse shape, good resolution and reliable operation in the presence of severe environmental conditions around the flow meter.

## 3,745,471
## MULTIPLE OUTPUT FREQUENCY REFERENCE WAVE GENERATOR

David L. Lafuze, Fairview, Pa., assignor to General Electric Company, Wilmington, Mass.

Filed Dec. 28, 1971, Ser. No. 213,129
Int. Cl. H03k 3/78
U.S. Cl. 328—61 12 Claims

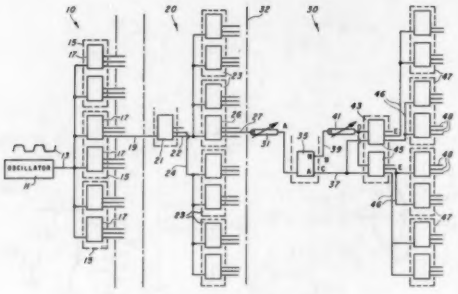


A multi-frequency reference wave generator is provided in which first and second frequency sources are coupled respectively to first and second inputs of a discriminator. The discriminator provides an output equal to the difference of the frequencies at the first and second inputs. A third frequency source is provided having a selectable frequency and coupled for modifying the signal appearing at the first input of the discriminator, whereby a selectable output frequency is provided.

## 3,745,472
## SYNCHRONOUS DIGITAL SYSTEM HAVING A CLOCK DISTRIBUTION SYSTEM

Emory C. Garth, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 1, 1971, Ser. No. 158,718
Int. Cl. H03k 1/00
U.S. Cl. 328—63 2 Claims

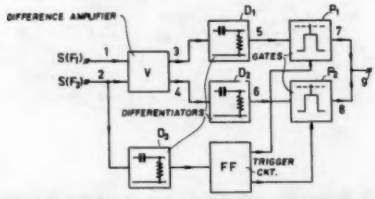



A clock distribution system within a synchronous digital system, such as a digital data processing system, permits adjustment of clock pulse width and time occurrence at each individual logic card within the system. An oscillator generates a clock signal having a pulse width larger than the desired clock pulse width. This generated clock signal is distributed through a plurality of fanout circuits to a plurality of logic cards located throughout the system. On each logic card a first adjustable delay line permits time delay adjustment to realign waveform transistions and thus synchronize the system. This time-aligned signal is then connected to one input of an AND gate and also is inverted and connected through a second adjustable delay line to the other input of the AND gate, thus permitting selective control of the clock pulse width.

## 3,745,473
## MIXER CIRCUIT

Gerrit Klein, and Karel Elbert, both of Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 715,357, March 22, 1968, abandoned. This application Mar. 12, 1971, Ser. No. 123,894
Int. Cl. H03b 3/04
U.S. Cl. 328—133 4 Claims

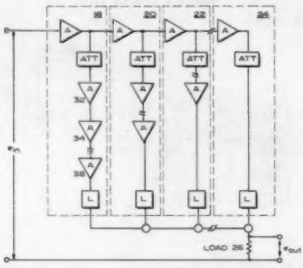



A mixing circuit avoids the production of image frequencies by producing pulses corresponding to the times two input waves have the same instantaneous amplitude and sign of the product of the signs of their time derivatives is constant. The pulses control a trigger circuit, and the output of the trigger circuit is filtered.

## 3,745,474
## HIGH SPEED LOGARITHMIC VIDEO AMPLIFIER

Richard Smith Hughes, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1971, Ser. No. 209,839
Int. Cl. G06g 7/24
U.S. Cl. 328—145 1 Claim

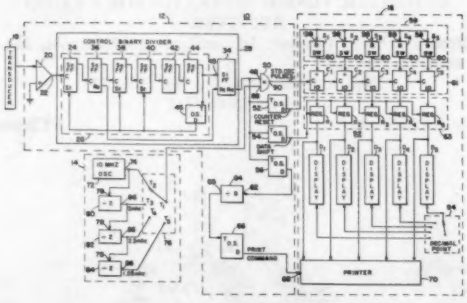



A multistage, parallel summation, logarithmic video amplifier, capable of handling very short pulses in which linear amplifier(s) are used in each stage as delay device(s) such that all of the stages simultaneously provide their output in response to each input pulse.

## 3,745,475
## MEASUREMENT SYSTEM

John W. Turner, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 7, 1971, Ser. No. 205,675
Int. Cl. G01r 23/10
U.S. Cl. 328—134 5 Claims



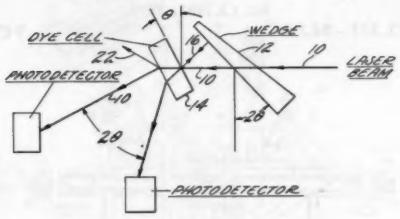

A measurement system for providing an indication of a varying physical quantity represented by or converted to a variable frequency signal. Timing pulses are obtained marking the duration of a fixed number, or set, of cycles of the sampled signal and these timing pulses are employed to control the period of counting of cycles of a higher fixed and known frequency source. The counts of cycles thus obtained from the fixed frequency source provide a precise measurement of the average frequency of each set of cycles sampled, and thus successive discrete values of the quantity being measured. The frequency of the known frequency source is made such that each measurement is presented as a direct digital representation of the quantity measured.

3,745,476

## LIGHT AMPLIFICATION USING ABSORBING MEDIUM

Michael E. Mack, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 792,680, Jan. 21, 1969, abandoned. This application Apr. 8, 1971, Ser. No. 132,532
Int. Cl. H01s 3/10
U.S. Cl. 330—4.3 5 Claims




An absorbing medium under the influence of a sufficiently intense light beam from a laser will amplify a weaker light beam simultaneously incident on the absorbing medium. If the two beams make a small angle with each other, a third light beam is produced. Optical coincident logic may be performed with the light beams.

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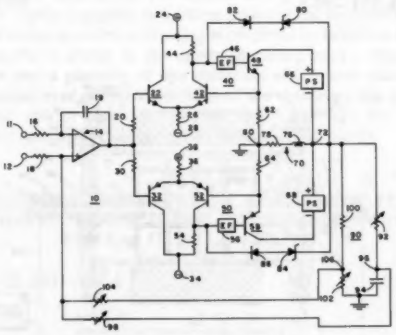
3,745,477

## AMPLIFIER APPARATUS FOR USE WITH AN INDUCTIVE LOAD

John C. Freeborn, West Covina, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 26, 1972, Ser. No. 221,009
Int. Cl. H03f 3/18, 1/34
U.S. Cl. 330—13 10 Claims



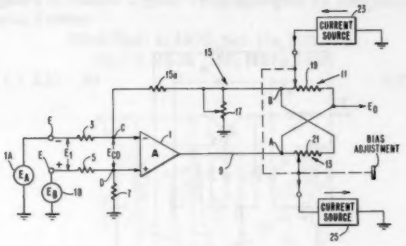
Amplifier apparatus for precisely controlling current through an inductive load by means of an RC network which produces a feedback signal accurately simulating the load current. The RC network includes a resistor and a capacitor connected in series across the load and having values related to the parameters of the load such that a signal representative of the instantaneous load current is produced between the resistor and capacitor. The RC network may also include a T resistor arrangement to compensate for any lag occurring between the input and output signals of the amplifier.

3,745,478

## DIFFERENTIAL AMPLIFIER WITH VARIABLE OUTPUT VOLTAGE BIAS

Frank J. Affinito, Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1971, Ser. No. 147,487
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 8 Claims




A differential amplifier arrangement with variable output voltage bias, which bias is continuously variable over the full amplifier output voltage range with bias settings being unaffected by nor disturbing the closed-loop gain setting. In addition, the input common-mode voltage range and the common-mode rejection ratio remain unchanged with bias settings. The variable output voltage bias arrangement employs a pair of networks each including a potentiometer and current source arranged in the amplifier feedback loop, such that one current source acts to insert current to provide the desired output voltage bias while the other current source acts to extract substantially all of the inserted current provided by the first source.

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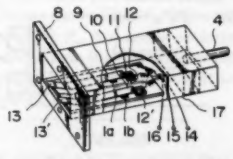
3,745,479

## MICROWAVE OSCILLATOR STRUCTURE FOR PARALLEL OPERATION OF SOLID-STATE DIODES

Takahiro Okabe, and Shigenobu Shinohara, both of Hamamatsu, Japan, assignors to President Shizuoka University, Shizuoka, Japan

Filed Jan. 17, 1972, Ser. No. 218,267
Claims priority, application Japan, Jan. 18, 1971, 46/1304
Int. Cl. H03b 7/14
U.S. Cl. 331—56 4 Claims

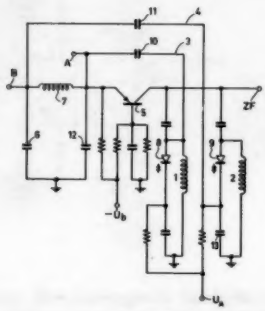


A solid-state oscillator circuit suitable for parallel operation of the diodes comprising a waveguide and at least two parallel-plate resonators provided in the waveguide. Respective diode for the parallel plate resonator is mounted at a selected location for producing desired oscillation frequency. Bias potential is applied to each diode for separate excitation.

## 3,745,480
## OSCILLATOR CIRCUIT FOR SEVERAL FREQUENCY RANGES HAVING PLURAL FEEDBACK PATHS

Walter Putzer, Krefeld, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1972, Ser. No. 233,677
Claims priority, application Germany, Apr. 7, 1971, P 21 16 901.7
Int. Cl. H03b 5/12; H03j 3/18, 5/00
U.S. Cl. 331—60 10 Claims



Oscillator circuit for several frequency ranges including for each range a frequency-determining resonant circuit having a tuning element, which are all simultaneously operated. From each of said resonant circuits a capacitive feedback path leads to a fixed parallel resonant circuit in the input circuit of an amplifying element.

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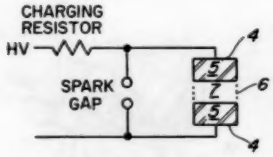
## 3,745,481
## ELECTRODES FOR OBTAINING UNIFORM DISCHARGES IN ELECTRICALLY PUMPED GAS LASERS

George F. Erickson, and Thomas F. Stratton, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed June 13, 1972, Ser. No. 262,415
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 4 Claims

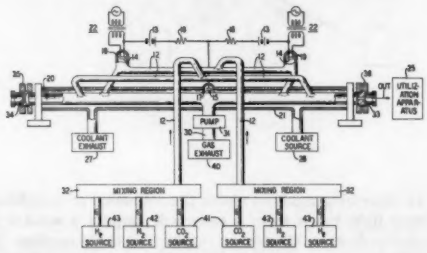



Uniform "glow-type" electrical discharges are established in gaseous laser media at atmospheric pressure through use of dielectric electrodes consisting of ferroelectric ceramic materials. These electrodes may be used to produce both volume ionization and molecular excitation of the media or alternatively a second set of electrodes operating transversely to the dielectric electrodes may be used for molecular excitation, i.e., electrical pumping, of the gas volume.

## 3,745,482
## CARBON DIOXIDE LASER EMPLOYING MULTIPLE GASES INCLUDING HELIUM

Chandra K. N. Patel, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 814,510, March 28, 1969, Pat. No. 3,596,202, which is a continuation-in-part of Ser. No. 409,682, Nov. 9, 1964, abandoned, and a continuation-in-part of Ser. No. 474,546, July 26, 1965, abandoned, and a continuation-in-part of Ser. No. 495,844, Oct. 14, 1965, abandoned. This application Nov. 30, 1970, Ser. No. 93,564
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 G 7 Claims




There is disclosed a laser providing emission of coherent radiation near 10 microns in the far infrared and utilizing transitions between vibrational-rotational levels in carbon dioxide. Also disclosed are beneficial effects from addition of helium to various forms of such a laser.

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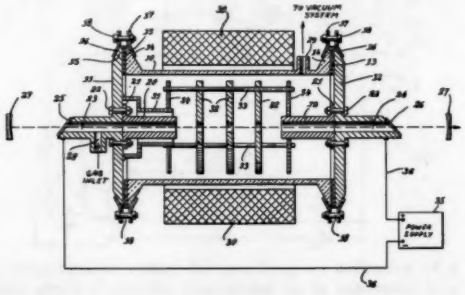
## 3,745,483
## INERT GAS LASER WITH CONTINUOUS GAS FLOW

David A. Huchital, Trumbull, and Jameson D. Rigden, Westport, both of Conn., assignors to The Perkins-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 656,157, July 26, 1967, abandoned. This application July 6, 1970, Ser. No. 52,670
Int. Cl. H01s 3/22, 3/09
U.S. Cl. 331—94.5 9 Claims

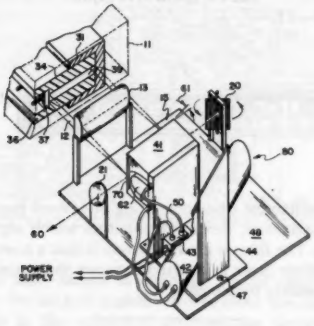



In a laser comprising an enclosure and a pair of electrodes therein, a stream of inert gas is flowed out through the bore of a hollow negative electrode. An electric discharge is produced in the stream by means of a potential difference between the electrodes. Ions from the discharge are attracted into the negative electrode, bombarding it and causing electron emission. The emitted electrons excite ions in the discharge to the upper laser energy level. Laser action is achieved by providing a resonant optical cavity.

## 3,745,484
## FLOWING LIQUID LASER

**Robert F. Caristi, Stoneham, Mass., assignor to Avco Corporation, Cincinnati, Ohio**

**Filed Mar. 16, 1972, Ser. No. 235,216**
**Int. Cl. H01s** *3/20*
**U.S. Cl. 331—94.5** **5 Claims**

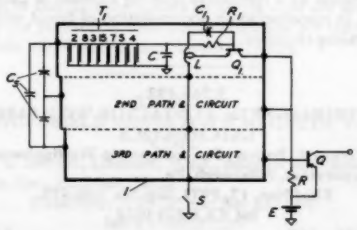



Stimulated emission of radiation (laser action) is produced in materials generally classed as dyes. These dyes may be dissolved in a liquid solution. A quantity of dye in a flowing liquid solution in a module is pumped or excited by a laser beam radiating in the ultraviolet region which is focused to a line with a cylindrical lens. A rectangular beam of such radiation is produced by a pulsed cross field nitrogen gas laser. The focused line which is transverse to the beam produced by the exciting laser, and transverse to the direction of the flowing dye lies near the surface of the dye material in the working region of the module, and is substantially as long as the cell is wide. The module being an integral unit with a cell, reservoir, and circulating means attached, the working region of which lies within an intensifying optical cavity which may be formed by a 100% reflecting mirror and a 10% mirror both perpendicular to the line of focus of the pumping radiation. The stimulated emission from the dye material is characterized by a short pulse width and little loss of energy between the two lasers. High pulse rates with dye circulation, and high conversion efficiencies of the dye when so pumped, are obtained. For frequency adjustment the optical cavity substitutes for the 100% mirror a grating or Littrow prism at the appropriate angle. Further spectral narrowing is obtained by inserting a tilted Fabry-Perot etalon in the cavity. By using such a frequency tuner and a plurality of dye materials which emit stimulated radiation over different portions of the spectrum, the present device can provide laser radiation for virtually the whole visible spectrum and into the infrared and ultraviolet.

## 3,745,485
## ELECTROACOUSTIC SURFACE WAVE TIMING SYSTEM

**Clarence H. McShan, 21 Bluff Point Road, Northport, N.Y.**

**Filed Aug. 13, 1971, Ser. No. 171,706**
**Int. Cl. H03b** *5/30*
**U.S. Cl. 331—107 A** **5 Claims**

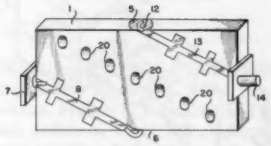



Two or more circulating waves are maintained in a non-dispersive electroacoustic surface wave delay medium. The periodicity or circulating frequency of each wave is related respectively to a different multiple of common wave length and an exact multiple relationship is maintained by cross-synchronization between delay paths. Periodic coincidence between or among the waves produces an output signal whose period may be in seconds or minutes if desired.

## 3,745,486
## MICROWAVE INTEGRATED CIRCUIT

**Bernard Chiron, and Jean Puyhaubert, Paris 16, France, assignors to Societe Lignes Telegraphiques Et Telephoniques, Paris, France**

**Filed Mar. 1, 1972, Ser. No. 230,775**
**Int. Cl. H03h** *7/30;* **H01p** *3/08*
**U.S. Cl. 333—30** **6 Claims**

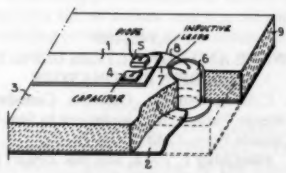


A microwave integrated circuit operating as an acoustic delay line comprises a substrate, at least an input strip line conductive pattern and an output strip line conductive pattern deposited on said substrate, at least one electroacoustic transducer between said lines and said substrate located so that the acoustic waves propagate within the substrate along a preferred axis.

## 3,745,487
## MICROWAVE PHASE-SHIFT DEVICES OF THE O-π TYPE

**Roland Milard, and Charles Hubert, both of Paris (16 eme), France, assignors to Thomson-CSF, Paris, France**

**Filed Oct. 18, 1971, Ser. No. 190,133**
**Claims priority, application France, Oct. 23, 1970, 7038330**
**Int. Cl. H01p** *1/18*
**U.S. Cl. 333—31 R** **4 Claims**




A O - π microwave phase-shift device for operation in a wide frequency band, is provided.

The device, connected to one end of a two-wire microwave propagation line, comprises a filter $F_m$ followed by a semi-conductor diode. The filter $F_m$ is a series *m*-derived half-section low-pass filter derived from the half-section low-pass filter circuit equivalent to the diode end its output connections, the diode being reverse-biased.

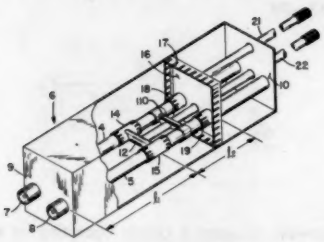
## 3,745,488
## MICROWAVE IMPEDANCE-MATCHING NETWORK

**Robert G. Rogers, Los Altos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.**

**Continuation-in-part of Ser. No. 115,449, Feb. 16, 1971, Pat. No. 3,699,475. This application Nov. 1, 1971, Ser. No. 194,383**
**Int. Cl. H03h** *7/38;* **H01p** *3/08*
**U.S. Cl. 333—33** **16 Claims**

In preferred form, a matching network includes a transmission line comprising a pair of parallel inner conductors sym-

metrically located in an outer conductor enclosure for supporting odd and even modes of propagation. Impedances to be matched are connected between adjacent one ends of the inner conductors and the enclosure. First and second sections of the transmission line, measured from the one ends of the conductors, are formed by short circuiting the inner conductors together and both inner conductors to the enclosure, respectively, at points that are spaced from the one ends of the conductors. The first transmission line section supports both the even and odd modes of propagation while the second line section primarily supports only the even mode of propagation. The positions of the short circuits are moved along the inner



conductors in order to match the impedances. In an alternate embodiment, the network includes a pair of parallel inner conductors symmetrically located in a first cylindrical conductor, the latter being coaxially supported in a second cylindrical conductor. First and second sections of short circuited transmission line are formed by short circuiting the cylinders together and by short circuiting both inner conductors to the first cylinder, respectively. The positions of the short circuits are separately moved along the cylinders in order to match impedances that are connected between associated inner conductors and the second cylinder. Stripline versions of these networks are also disclosed.

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**3,745,489**

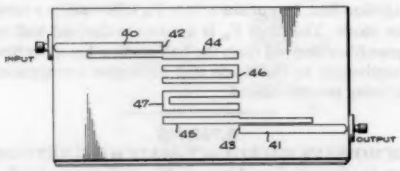
**MICROWAVE AND UHF FILTERS USING DISCRETE HAIRPIN RESONATORS**

**Edward G. Cristal, Dundos, Ontario, Canada, and Sidney Frankel, Menlo Park, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.**

**Filed May 1, 1972, Ser. No. 249,071**

**Int. Cl. H03h** *7/10, 9/00*

**U.S. Cl. 333—70 S** **5 Claims**




A new class of microwave and UHF filters is disclosed using only discrete hairpin resonators, with input and output lines either open circuited or short circuited at their ends, or using both discrete hairpin resonators and half-wave parallel-coupled line filter structures in hybrid filter configurations.

**3,745,490**

**ELECTROMECHANICAL FILTER**

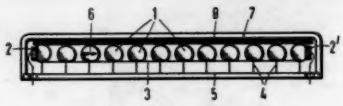
**Karl Traub, Olching, Germany, assignor to Siemens Aktiengesellschaft, Munich, Erlangen, Berlin, Germany**

**Filed Sept. 21, 1971, Ser. No. 182,491**

**Claims priority, application Germany, Sept. 30, 1970, P 20 48 162.3**

**Int. Cl. H03h** *7/10, 9/00*

**U.S. Cl. 333—71** **1 Claim**




Electromechanical filter consisting of several mechanically coupled, mechanical, flexural resonators which are arranged in a housing. The filter is characterized in that a sound absorbing intermediate layer is inserted between the resonators and at least one wall of the housing.

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**3,745,491**

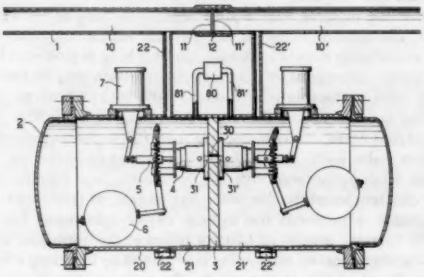
**AUTOMATIC VALVE FOR PIPE LINES UNDER GAS PRESSURE**

**Jacques Bendayan; Jean Duret, both of Lyon, and Roger Cartet, Villefranche-sur-Saone, all of France, assignors to Cables De Lyon-Alsacienne-Geoffroy. Delore, Lyon, France**

**Filed Mar. 30, 1972, Ser. No. 239,667**

**Int. Cl. H01p** *1/30*

**U.S. Cl. 333—98** **10 Claims**




An automatic gate valve for interrupting the communication between two pipe line sections which are under the pressure of gas in case there is a propagation or infiltration of liquid from one section toward the other, characterized in that it consists of an enclosure which is subdivided vertically by means of a wall into two compartments, each compartment being connected to one of said pipe sections with which it is associated, the compartments being interconnected by means of a calibrated passage terminating at each end in an orifice positioned opposite a closing device controlled through connecting means by a respective floating element in each compartment in response to an accumulation of liquid within the corresponding chamber.

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**3,745,492**

**ELECTROMAGNETIC CONTACTOR WITH SAFETY LATCH DEVICE**

**Kurt A. Grunert, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

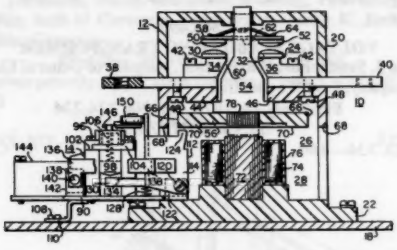
**Filed Nov. 17, 1971, Ser. No. 199,473**

**Int. Cl. H01k** *9/24*

**U.S. Cl. 335—167** **8 Claims**

Electric control apparatus of the electromagnetic type in which movable contacts are movable between contacting and

non-contacting positions relative to stationary contacts by electromagnetic means for opening and closing a circuit; latch means for holding the movable contact in the non-contacting position when there is an open circuit through the electromagnetic means; and switch means for opening and closing the circuit through the electromagnetic means which switch is actu-



ated by the latch means to open the circuit when the latch means is in the latched position and to close the circuit when the latch is in the unlatched position, the foregoing latch means being controlled by a first operator. The apparatus also includes an additional latch means under the control of a second operator for independent purposes.

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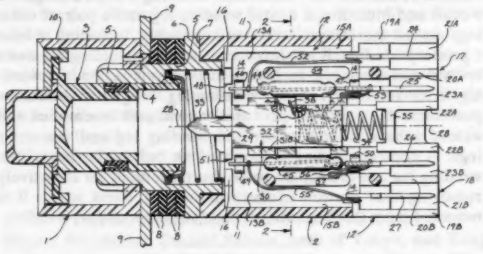
**3,745,493**

**REED SWITCH CARTRIDGE**

**Richard A. Funke, New Berlin, Wis., assignor to Allen Bradley Company, Milwaukee, Wis.**

**Filed Sept. 1, 1972, Ser. No. 285,720**
**Int. Cl. H01h** *13/50*
**U.S. Cl. 335—206** **12 Claims**



A reed switch cartridge is attached for operation by an oil tight switch actuator and is interchangeable with conventional switch cartridges. Two embodiments are shown and each includes a pair of reed switches which are positioned in switch chambers located on opposite sides of a plunger. A magnet carried by the plunger is polarized in the direction of plunger motion and generates a concentrated magnetic field at each of its ends. By operating the reed switches off the ends of the magnet a minimum amount of space is required for the switch-magnet combinations and changes in "pick-up" and "drop-out" points are minimized despite possible variations in magnet length or flux density. Means including clips are shown for adjusting the position of each reed switch and for thereby adjusting their initial pick-up and drop-out points.

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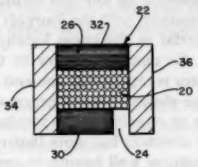
**3,745,494**

**FIBEROUS SHIELD MEANS FOR A MAGNETIC FOCUS COIL**

**Carleton E. Sawyer, Littleton, Mass., assignor to Display Components, Inc., Littleton, Mass.**

**Filed Mar. 7, 1972, Ser. No. 232,588**
**Int. Cl. H01f** *7/00*
**U.S. Cl. 335—210** **8 Claims**

A magnetic focus system in which a cylindrical wire coil is enclosed by a magnetic shield in the shape of a hollow cylinder. An annular gap is provided in the interior wall of the shield. The shield is formed of a plurality of substantially



parallel, magnetically conducting fibers in a matrix of dielectric material oriented with respect to the magnetic field so that the permeability of the shield is anisotropic.

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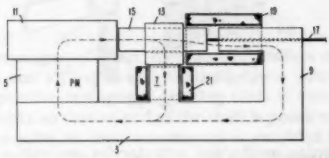
**3,745,495**

**MAGNETIC ACTUATOR MECHANISM**

**Hi D. Chai, Binghamton; Stephen H. Mills, Newark Valley, Joseph P. Pawletko, Francis E. Peters, both of Endwell, and Carl T. Young, Hillcrest, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 16, 1971, Ser. No. 208,569**
**Int. Cl. H01f** *7/08*
**U.S. Cl. 335—229** **3 Claims**



A magnetic actuator comprising a stationary magnetic core structure having two distinct magnetic flux paths, with a movable armature included in both the flux paths and movable between a rest position and an actuated position. A permanent magnet or winding provides reset or restore flux, and a first winding includes the armature and opposes the restore flux. A second winding provides the major armature attractive force.

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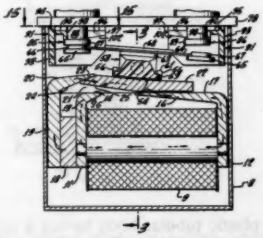
**3,745,496**

**MAGNETIC RELAY MEMBERS WITH GRAIN OF THE MATERIAL EXTENDING LONGITUDINALLY THEREOF**

**Melvyn R. Tichy, Brea, Calif., assignor to The Deutsch Company, Electronic Components Division, Banning, Calif.**

**Division of Ser. No. 91,005, Nov. 19, 1970, Pat. No. 3,688,230.**
**This application Apr. 26, 1972, Ser. No. 247,890**
**Int. Cl. H01f** *7/08*
**U.S. Cl. 335—230** **4 Claims**



A relay including an armature moving in a gap between pole pieces in which the grain of the material of the pole piece and

armature extends to the surfaces at the gap to reduce reluctance, a contact carrier being secured to the armature by tabs twisted to overlap the flanges on the contact carrier, the armature being mounted on journals formed from brackets at the ends of the armature, with the journals being produced by reducing the material in thickness locally and deforming it outwardly into a die complementary to the contour of the journal. An insulator is retained at one end of the armature assembly by a wedge-shaped projection on the contact carrier that is received in an opening in the insulator. An arc barrier for the stationary contacts has slots that receive the contact shanks and a transverse wall having an opening between the contacts so that flow of gas is induced to suppress an arc between the contacts as the armature is actuated.

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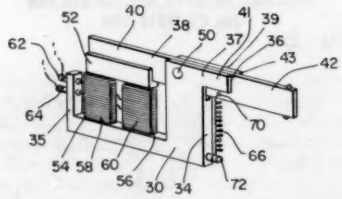
**3,745,497**
**PRINTING MECHANISM ACTUATOR**
**James J. Cavella, Philadelphia, Pa., assignor to Datadyne Corporation, King of Prussia, Pa.**
**Filed Aug. 11, 1971, Ser. No. 170,734**
**Int. Cl. H01f 7/08**
**U.S. Cl. 335—266** **3 Claims**




A printing mechanism actuator for use with a hammer assembly in an on-the-fly type digital printer. The actuator is magnetically actuated and through an actuating arm imparts force to a corresponding hammer pin to cause it to be thrust into printing position. Support structure aligns the actuating arm, and spring biasing means connected to the support effectively returns the actuating arm to its resting position after actuation. The actuators are placed so that each succeeding actuator opposes the preceding actuator with only the hammer impact areas forming a common line and this design coupled with the compactness of the actuators permits the placement of ten units per lineal inch.

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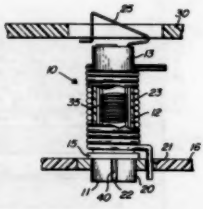
**3,745,498**
**COIL FORM**
**Ray E. Hagood, Fort Lauderdale, Fla., assignor to Motorola, Inc., Franklin Park, Ill.**
**Filed July 3, 1972, Ser. No. 268,420**
**Int. Cl. H01f 15/02**
**U.S. Cl. 336—65** **10 Claims**




A molded plastic tubular body having a copper sleeve fixedly engaged about one end thereof adapted to be inserted into a printed circuit board and soldered thereto for electrical contact and mechanical bond. An integrally formed positioning shoulder adjacent the one end for positioning the body relative to the printed circuit board, integrally formed longitudinally extending ribs within the central opening of the body for threadedly receiving a cylindrical tuning core with threads in the outer periphery thereof and a resilient contact affixed to the opposite end of the body so as to extend axially outwardly therefrom to electrically engage an antenna.

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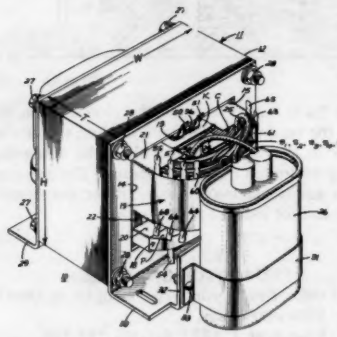
**3,745,499**
**VOLTAGE STABILIZING TRANSFORMER**
**Harold J. Smith, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.**
**Filed July 24, 1972, Ser. No. 274,224**
**Int. Cl. H01f 27/28**
**U.S. Cl. 336—160** **7 Claims**



A voltage stabilizing transformer having a magnetic core formed of interleaved laminations defining a closed magnetic circuit and including a center winding leg and a pair of outer legs spaced therefrom. A first coil assembly, including at least a primary winding, is mounted on the center winding leg and a second coil assembly, including at least one secondary winding, is mounted on a center winding leg. Magnetic shunts are positioned between the first and second coil assemblies and extend substantially between the winding leg and the outer legs. A control winding is mounted on only a portion of the winding leg and is adapted to be short circuited for effectively removing that portion of the winding leg about which it is mounted from the magnetic circuit for the secondary winding.

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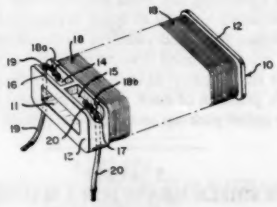
**3,745,500**
**FLAT WOUND COILS**
**Robert A. Simon, Windsor, N.Y., assignor to Union Electronics, Windsor, N.Y.**
**Filed Nov. 8, 1971, Ser. No. 196,398**
**Int. Cl. H01f 15/10**
**U.S. Cl. 336—192** **4 Claims**



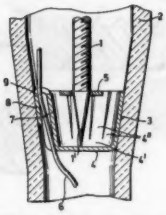

A flat wound coil is provided having a hollow rectangular plastic spool with a transverse flange at one end and a transverse head at the other end, said head having two spaced pockets receiving the coil ends and the ends of lead wires with the lead wires extending through passages in the head and an outer heat sealed shell enclosing the coil and pockets.

3,745,501

## SEATING FOR THE SCREW SPINDLE AND GUIDE MEANS FOR THE SLIDING CONTACT WIRE IN A GLASS TUBE THERMOMETER OF ROUND, NON-CIRCULAR OR POLYGONAL CROSS SECTION AND CONTAINING ADJUSTABLE ELECTRICAL CONTACT MEANS FOR TEMPERATURE

Peter Juchheim, Fulda, and Joachim Konig, Petersberg near Fulda, both of Germany, assignors to Moritz K. Juchheim, Fulda, Germany

Filed Dec. 29, 1971, Ser. No. 213,648
Claims priority, application Germany, June 1, 1971, P 21 27 039.3
Int. Cl. H01h 61/00
U.S. Cl. 337—122 5 Claims



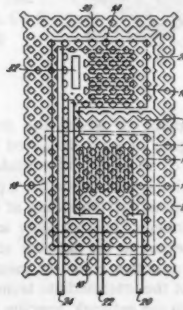
A seating for the screw spindle and a guide means for the sliding contact wire in a glass tube thermometer of round, non-circular or polygonal cross section and containing adjustable electrical contact means for temperature control and/or limitation. The seating for the screw spindle provided for setting the required temperature has a pan-shaped bottom and resilient blades forming the sides of the seating, one of the blades having an extension bent over inwards into parallelism with the pan-shaped bottom to form a lug containing a hole in which the lower end of the screw spindle is eccentrically or centrically held, whereas another of the blades is likewise extended but the extension bent over outwards into parallelism with the blade itself. The bend contains an opening and the blade itself a corrugation which in cooperation with the extension and together with the hole forms a tubular guideway for the electrical contact wire.

3,745,502

## HIGH TEMPERATURE STRAIN GAGE

Osamu Watanabe; Takeshi Shioda, both of Tokyo, and Kenji Kanai, Kawasaki, all of Japan, assignors to Kyowa Electronic Instruments Co., Ltd., Tokyo, Japan

Filed Sept. 18, 1972, Ser. No. 290,148
Claims priority, application Japan, Sept. 28, 1971, 46/75017
Int. Cl. G01l 1/22
U.S. Cl. 338—3 9 Claims



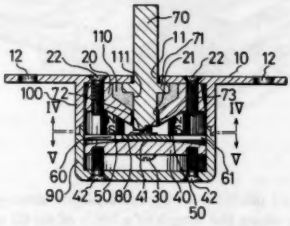
A high temperature strain gage comprising an active gage and a dummy gage mounted on a meshed metal base by means of heat-resisting adhesive such as ceramics. The gage is suitable to be mounted on a test piece either by spot welding or by an adhesive. The dummy gage is isolated from outer stress by providing openings in the meshed metal base around the dummy gage so that the dummy gage can always produce accurate temperature dependent error compensating output.

3,745,503

## GALVANO-MAGNETRO EFFECT APPARATUS

Tunekazu Kobayashi, Kanagawa, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1972, Ser. No. 280,992
Claims priority, application Japan, Aug. 16, 1971, 46/73204
Int. Cl. H01c 7/16
U.S. Cl. 338—12 10 Claims



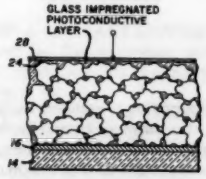
A galvano-magnetro effect apparatus in which a magnetic upper yoke and a flexible and magnetic lower yoke are arranged in parallel, a magnetic rotating shaft is mounted on said upper yoke so that an end of the shaft is positioned close to the lower yoke, at least one magnet is provided between said upper yoke and lower yoke so that a magnetic flux flows in the rotating shaft, a projected end which eccentrically moves in reference to the axis of the rotating shaft is provided at the lower surface of said rotating shaft, a magnetro-effect resistance device whose resistance between terminals is varied by eccentric movement of said projected end is arranged at said lower yoke, and a pushing means which pushes up the lower yoke and pushes upward the device securing position of the lower yoke is provided below the lower yoke.

3,745,504

## IMPREGNATED POROUS PHOTOCONDUCTIVE DEVICE AND METHOD OF MANUFACTURE

John B. Mooney, Saratoga, Calif., assignor to Photophysics, Inc., Mountain View, Calif.

Filed Mar. 22, 1971, Ser. No. 126,589
Int. Cl. H01c 7/08
U.S. Cl. 338—15 14 Claims



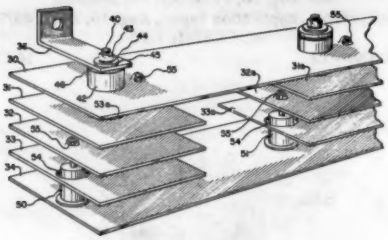

Impregnating a porous photoconductive device with molten glass, or some other physically and chemically stable substance, to make the dark resistance more predictable and to increase the charge retentivity many times.

**3,745,505**

## SEMICONDUCTOR DEVICE-METAL OXIDE VARISTOR-HEAT SINK ASSEMBLY

**Fred C. Turnbull, 829 Sanders Avenue, Scotia, and John D. Harnden, Jr., 1078 Parkwood Boulevard, Schenectady, both of N.Y.**

**Filed Oct. 21, 1971, Ser. No. 191,168**
**Int. Cl. H01c 7/10**
**U.S. Cl. 338—20** **38 Claims**



A single or plurality of metallic plates arranged in parallel relationship along the length of a body of metal oxide material in contact therewith provide a means for removal of heat developed in the bulk of the metal oxide material. The metal oxide material exhibits highly nonlinear resistance characteristics to provide transient voltage protection for semiconductor devices connected on or between the metallic plates or between the metallic plates and terminals mounted along the body of metal oxide material at selected voltage points.

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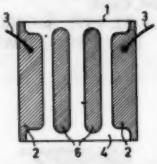
**3,745,506**

## THERMISTOR AND METHOD OF MANUFACTURING SAME

**Klaus Bethe, Ellerbek, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 16, 1971, Ser. No. 208,566**
**Claims priority, application Germany, Jan. 8, 1971, P 21 00 789.6**
**Int. Cl. H01c 7/04**
**U.S. Cl. 338—22** **15 Claims**



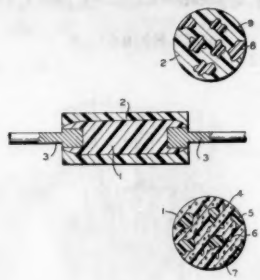
A thermistor comprising a monocrystalline semiconductor substrate having at a surface thereof both first and second electrically energized electrodes and means for providing a higher current density at the central region of this surface than at the edge of this surface and at the other surfaces of the substrate, which means comprises at least one electrically-floating field-conducting electrode between the first and second electrode. In one embodiment, the field-conducting electrode is spaced from the edge of the surface on which it is located. In another embodiment, the thermistor also includes a conducting edge limitation.

**3,745,507**

## NONFLAMMABLE COMPOSITION RESISTOR

**Tomio Ishida, Hirakata-shi; Kunio Sato, Neyagawa-shi; Kanji Sugihara, Hushata-shi, and Shigeru Yoshida, Osaka-fu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Aug. 18, 1972, Ser. No. 281,937**
**Int. Cl. H01c 7/00**
**U.S. Cl. 338—25** **18 Claims**



A nonflammable composition resistor comprising a resistor body consisting essentially of finely divided conducting powder, silica powder and an additive powder dispersed in resin, said additive powder having a transforming temperature in the range from Tg°C to (Tg+200)°C, wherein Tg°C is a glass transition temperature of said resin. This nonflammable composition resistor is free from arcing, burning, charring and mechanical damage and exhibits an irreversible extreme increase of electrical resistance under serious overload conditions.

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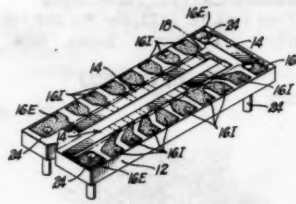
**3,745,508**

## SELECTABLE FIXED IMPEDANCE DEVICE

**Frank J. Bruder, Newport Beach; James F. Parham, Yorba Linda, and Victor F. Steuer, San Jacinto, all of Calif., assignors to Bourns, Inc., Riverside, Calif.**

**Filed May 25, 1972, Ser. No. 256,661**
**Int. Cl. H01c 1/16**
**U.S. Cl. 338—320** **26 Claims**

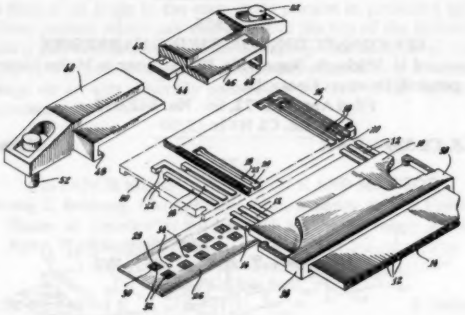


An impedance device in which the impedance can be selected within a range of predetermined fixed values. The device is comprised of an electrically insulating substrate on which is attached an impedance network, a plurality of electrically conductive terminations including at least two end terminations and a number of intermediate terminations which are electrically connected to the network at preselected locations, electrically conductive collector means spaced a short distance from each of the intermediate terminations and electrically insulated from the network, spacing means for spacing the collector means from the intermediate terminations and means for selectively connecting selected intermediate terminations to the collector means.

### 3,745,509
### HIGH DENSITY ELECTRICAL CONNECTOR

**Stephen Guild Woodward, Cheshire, and John Phillip Treschitta, Norwalk, both of Conn., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.**

**Filed Mar. 2, 1971, Ser. No. 120,077**
**Int. Cl. H01r *13/54*; H05k *1/02***
**U.S. Cl. 339—14 R** **33 Claims**

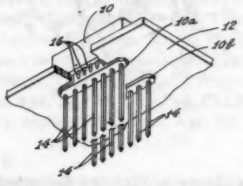


A device for connecting a high-density multi-conductor line to an element having electrically conducting portions. Each signal conductor of the line is electrically connected to a conducting segment of an inter-connecting wafer formed of conducting material, the segments being electrically isolated from each other and from the conducting material of the wafer by dielectric material. The other end of each segment passes through the wafer and contacts a malleable portion secured to a conducting island of an electrically conducting connecting wafer. The islands are electrically isolated from the conducting material of the wafer and from each other by dielectric material. The wafers are secured together and mounted in a housing which preferably also contains a pressure pad. For preferred embodiments, the ground conductor of the line is secured to the conducting material of the inter-connecting wafer with malleable portions being secured to the conductive material of the connecting wafer to carry the ground level to this wafer. Malleable portions are also provided on the underside of each island and on the underside of the conducting material of the connecting wafer. The conducting portions of the element are brought into contact under pressure with these portions to complete a connection.

### 3,745,510
### PRINTED CIRCUIT BOARD/INTEGRATED CIRCUIT SOCKET COMBINATION

**Marvin C. Mallon, Canoga Park, Calif., assignor to Interdyne Company, Los Angeles, Calif.**

**Filed July 2, 1971, Ser. No. 159,185**
**Int. Cl. H01r *13/48*; H05k *1/04***
**U.S. Cl. 339—17 R** **3 Claims**

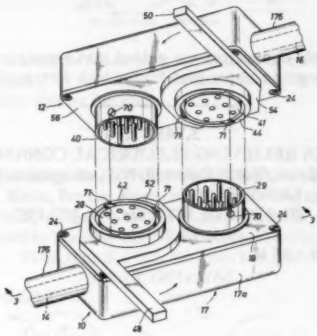


An improved printed circuit board and socket combination for integrated circuit elements is provided. Sockets for receiving the terminal pins of integrated circuit units are mounted on a printed circuit board by a press-fit into respective openings in the board. Connections are made between selected protruding terminal pins of the sockets and either a ground or power conductive strip on the circuit board by conductive clips fitted over the selected terminal pins and soldered, or otherwise affixed to the selected conductive strips.

### 3,745,511
### MULTICONDUCTOR CABLE CONNECTOR

**Donald L. Fussell, Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.**

**Filed June 16, 1971, Ser. No. 153,618**
**Int. Cl. H01r *13/54*, *25/00***
**U.S. Cl. 339—49** **7 Claims**



A multiple wire electrical cable connector device is disclosed. The device includes two connector assemblies, with each assembly adapted to be connected to the end of a multiple wire electrical cable. Each connector assembly is of the same construction and includes both a male and a female connector so that any two connector assemblies can be connected together to connect electrically the conductors in the cables to which they are attached. The male and female connector of each assembly is mounted in a face plate in side by side position to mate with a male and female connector in another assembly. A locking ring is provided for each engaging male and female connector that, when rotated to one position, allows the two connectors to be moved apart or brought together and, when rotated to another position, will lock the two mating connectors and hold them from moving apart. In the device disclosed, a lever arm is attached to each locking ring that extends out from between the face plates when the locking ring is in the unlocked position, but which, when moved to a position betweeen the plates, will lock the two pairs of mating connectors together and, in turn, lock the two connector assemblies together.

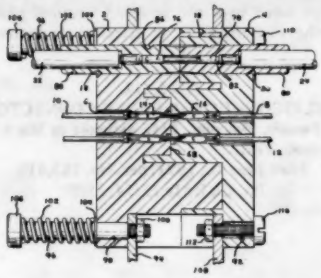
### 3,745,512
### MULTIPLE CONTACT CONNECTOR

**Erlon Fitch Johnson; Jay Calvin Gerber, and Donald Eugene Crabb, all of Elizabethtown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed May 16, 1968, Ser. No. 729,634**
**Int. Cl. H01r *13/52***
**U.S. Cl. 339—59 M** **1 Claim**

The disclosure relates to a polarized connector for high voltage cables. The cables are provided with male and female connector elements which are firmly secured in the connector to permit quick assembly and disassembly. The guides which are used to provide the proper polarization are of greater length than the male connectors in order to insure proper engagement of the connector housing elements before the cable elements are engaged. In one form of the invention low volt-

age cables are mounted in the center zone of the connector to allow patchwork connections. Connector elements for the low



voltage cable connectors are guided into proper engagement by the same guide means used for the high voltage cables.

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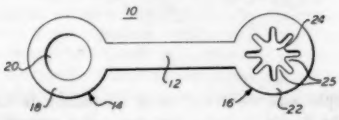
**3,745,513**

**STRAIN RELIEVING ELECTRICAL CONNECTOR**

**Robert D. Gross, North Caldwell, N.J., assignor to The Singer Company, Little Falls, N.J.**

**Filed Dec. 13, 1971, Ser. No. 207,197**
**Int. Cl. H01r *9/06***
**U.S. Cl. 339—95 R** **6 Claims**



This invention describes a form of electrical connector to be used on printed circuit board assemblies which provides mechanical isolation from the effects of dynamic loading due to the different thermal expansions of the printed circuit board and the component leads and/or vibration. This is done by soldering a first loop of the connector to the printed circuit board and soldering the second loop of the connector to the component lead, and two loops being interconnected by a flexible member which minimizes force applied to the solder joint under dynamic loading conditions.

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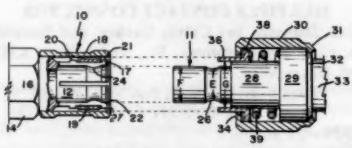
**3,745,514**

**COAXIAL CONNECTOR**

**Alexander R. Brishka, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.**

**Continuation of Ser. No. 856,980, Sept. 11, 1969, abandoned.**
**This application July 26, 1971, Ser. No. 165,939**
**Int. Cl. H01r *13/54***
**U.S. Cl. 339—91 R** **1 Claim**



A coaxial connector with male and female members, the female member having a slotted tubular structure forming jaws and having an internal abutment providing an interference fit with the male member which has an annular recess to receive the abutment and remove the interference. A sleeve having a larger diameter than the slotted tubular member is carried by this female member and provides an annular space between the jaws and the sleeve. A sleeve carried on the male member has a captive bushing which is spring urged forwardly to enter said annular space and prevent expansion of the jaws by completely overriding and overextending not only the end of said jaws but also the adjacent jaw area to provide a direct, non-slanting contact locking area and thereby achieve a positive, unbreakable connection.

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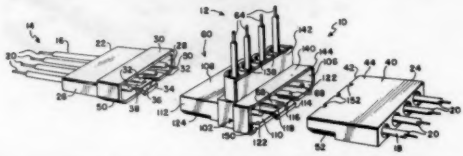
**3,745,515**

**TEE CONNECTOR FOR WIRING HARNESSES**

**Leonard H. Michaels, Naperville, Ill., assignor to Molex Incorporated, Downers Grove, Ill.**

**Filed Apr. 7, 1972, Ser. No. 242,055**
**Int. Cl. H01r *13/50***
**U.S. Cl. 339—156 R** **9 Claims**



A tee connector is connected between adjacent end connectors of a pair of main circuit wiring harnesses in a modular wiring system to provide a branch circuit take off. The connector includes an insulating housing having coupling portions each engageable with one of the end connector housings, and further includes a plurality of conductive terminals engageable with terminals of the end connectors. The housing of the tee connector includes cavities containing the terminals, each cavity including a main passage extending between the coupling portions of the housing and a transversely extending branch passage. Each terminal includes a main body portion having electrical contact disposed at the ends thereof and a branch body portion including flanges crimpable about a branch circuit wire. The terminal includes stop means for holding itself in position in the insulating housing, and the housing includes a housing portion which is separable from the main housing in order to expose the inside of the terminal receiving cavities for mounting of the terminals.

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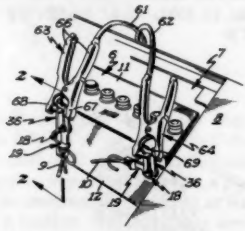
**3,745,516**

**AUXILIARY CLAMP FOR SIDE TERMINAL BATTERIES**

**Walter G. Lieberman, Minneapolis, Minn., assignor to Goodall Manufacturing Corporation, Minneapolis, Minn.**

**Filed Dec. 9, 1971, Ser. No. 206,316**
**Int. Cl. H01r *11/22*; H01m *5/00***
**U.S. Cl. 339—228** **6 Claims**



An auxiliary clamp is disclosed for selective manual attachment to a battery cable terminal bolt used with a side terminal battery. The clamp includes a body portion with electrically conducting clamping means for selective engagement with cable terminal bolts of different size. The body portion of the clamp projects from the terminal bolt to a location where

an electrically conducting terminal means on the body portion is conveniently accessible for the attachment of the resilient connecting jaws of an auxiliary battery charging or booster cable. The auxiliary clamp is preferably made from flat metal stock, and its body is bent in appropriate fashion to provide a stiff or reinforced area for the booster or charging cable clamps or other attachment and to serve as a handle for selective attachment and removal. In the preferred form, the clamping means is at one end of the body portion and includes resiliently separable clamping arms, the other end of the body is bent at an angle to the main body portion to provide a terminal portion which can extend above the top of the battery, and a slot between the resilient clamping arms extends all the way to the bent end portion which then provides a resilient hinge on an axis generally parallel to the axis of the battery terminal bolt.

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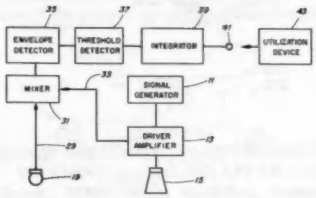
**3,745,517**

## DISTANCE MEASURING DEVICE AND METHOD

**Irving I. Sochard, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 11, 1970, Ser. No. 48,759**
**Int. Cl. G01s 9/68**
**U.S. Cl. 340—1 R** **5 Claims**




A distance measuring device utilizing a source of acoustic signals of at least a predetermined wavelength which is transmitted to a reference surface and the reflected acoustic signal is received in a detector. The transmitted and received signals are phase-mixed in a mixer to provide a signal responsive to the distance between the distance measuring device and the reflecting surface irrespective of the presence of a non-rigid intervening media, such as foliage, which obstructs the desired reflecting surface. An envelope detector and a threshold device provide a utilization signal when the distance between the distance measuring device and the reflecting surface reaches a predetermined value.

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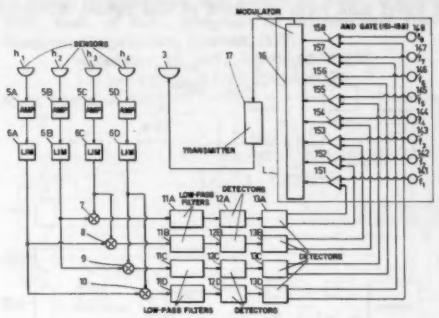
**3,745,518**

## METHOD FOR DETERMINING THE DISTANCE BETWEEN A VESSEL AND A REFERENCE POINT AND DEVICE FOR CARRYING OUT THIS METHOD

**Jean-Pierre Barret, Chambourcy; Jean-Francois Therond, Neuilly, and Jacques Harbonn, Jouars Ponchartrain, all of France, assignors to Institut Francais au Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France**

**Filed Apr. 12, 1971, Ser. No. 132,977**
**Claims priority, application France, Apr. 15, 1970, 7013718**
**Int. Cl. G01s 3/80**
**U.S. Cl. 340—3 E** **18 Claims**

Method for determining the deviation distance of a vessel from a preselected point defined with respect to a set of sensors immersed in a predetermined position, comprising transmitting acoustic waves from said vessel, detecting the continuous phase differences between the waves received by said sensors by combining the output signals thereof with one another and/or with that of a reference sensor, converting said continuous variations to phase shift increments of constant value and transmitting in a coded form the number of said increments to a counter on the vessel.

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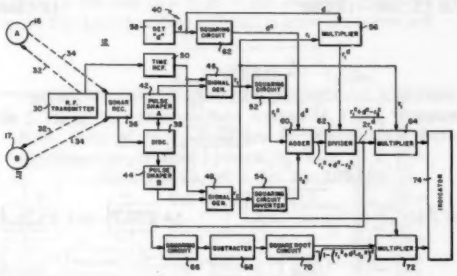
**3,745,519**

## SMALL CRAFT POSITIONING SYSTEM

**Adolph H. Klein, Bryans Road, and John D. Hoyt, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed June 3, 1971, Ser. No. 149,435**
**Int. Cl. G01s 5/18**
**U.S. Cl. 340—3 E** **2 Claims**




An automatic marine navigation system for use with small craft by reference to two fixed points. The fixed points may be moored sonar buoys which transpond acoustic pulses upon actuation by a radio frequency pulse from a remote transmitter on the craft. The time difference between the emitted radio frequency pulse and the received sonar pulse is measured for each buoy, and thence analyzed to obtain a rectangular coordinate plot of the small craft's position relative to the buoys.

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**3,745,520**

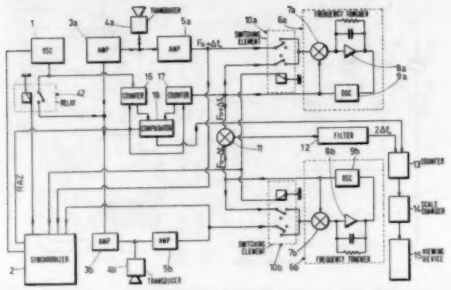
## METHOD FOR DETERMINING THE DISTANCE TRAVELLED OVER BY A VEHICLE WITH RESPECT TO A REFERENCE SURFACE AND DEVICE FOR PRACTISING SAID METHOD

**Jean-Pierre Barret, Chambourcy (Yvelines), and Max Monnot, Chatou (Yvelines), both of France, assignors to Institut Francais du Petrole, Des Carburants et Lubrifiants, Rueil-Malmaison, France**

**Filed June 15, 1971, Ser. No. 153,347**
**Claims priority, application France, June 24, 1970, 7023489**
**Int. Cl. G01s 9/68**
**U.S. Cl. 340—3 D** **8 Claims**

Method for determining the distance travelled over by a marine vehicle with respect to the sea bottom comprising

transmitting sequentially recognition signals from the vehicle towards the sea bottom along an inclined direction with respect to the latter, detecting the echos thereof, determining the travel time forth and back of said signals, transmitting



measuring signals of substantially the same duration as said time interval, measuring the frequency shift between the transmitted signal and its echo and estimating therefrom the distance travelled over by the vehicle.

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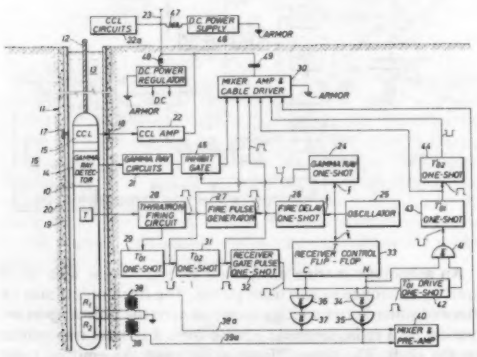
**3,745,521**

## METHODS AND APPARATUS FOR USE IN INVESTIGATING EARTH FORMATIONS

**Fred W. Zill, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.**

**Filed Aug. 1, 1969, Ser. No. 846,908**
**Int. Cl. G01v *1/22***
**U.S. Cl. 340—18 CM** **18 Claims**



In accordance with an illustrative embodiment of the present invention, a technique is disclosed for transmitting information derived from a plurality of exploring devices located in a well tool of a borehole over a common transmission channel to the surface of the earth. One of the exploring devices comprises a transmitter and two nearby receivers. The transmitter is periodically energized to emit energy into a media surrounding the well tool and a primary sync pulse representative of the time of each energy emission is transmitted to the surface of the earth. The electrical signals produced by the two receivers in response to the energy received thereby are processed for transmission to the surface of the earth on alternate occurrences of energy emission and a second sync pulse is transmitted a fixed time interval after the primary sync pulse transmission whenever the signal from a selected one of the receivers is processed for transmission to the surface of the earth. The signals transmitted to the surface of the earth from a second exploring device are blanked out from a time prior to the transmission of the primary sync pulse until after the received energy signal and secondary sync pulse have been transmitted. At the surface of the earth, detector circuits rely on this dead time interval prior to each primary sync pulse along with the periodic nature of these sync pulses to detect them. The surface circuits also search for the secondary sync pulse to identify which receiver produced each received energy signal.

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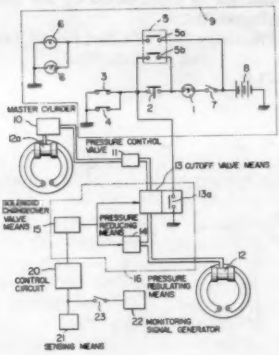
**3,745,522**

## MONITORING SYSTEMS AND ANTISKID DEVICES OF VEHICLES

**Masami Inada, Aichi-ken, Kariya-shi; Akiyoshi Hirai, and Hiroshi Arai, both of Aichi-ken, Toyota-shi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan, part interest to each**

**Filed Oct. 16, 1970, Ser. No. 81,415**
**Claims priority, application Japan, Oct. 18, 1969, 44/83409**
**Int. Cl. B60q *1/00*; B60t *8/08***
**U.S. Cl. 340—52 R** **8 Claims**



An antiskid device for a motor vehicle uses a cut-off valve provided with a switching element which, when the cutoff valve operates to isolate a master cylinder of the vehicle braking system from the wheel cylinders, is closed to supply voltage to a reference diode having a predetermined breakdown voltage. This breakdown voltage is reached only when the switching element is kept closed for a duration longer than a normal time interval at which the cutoff valve means operates. Prolonged operating periods of the cutoff valve means may expediently be exhibited by a pilot lamp. Another embodiment of the invention uses a sensing element and a control circuit and an associated monitoring signal generator capable of producing a monitoring signal of the same characteristics as the signal produced by the sensing element in the event of rapid deceleration of the vehicle wheels. The overall operation of the arrangement and circuit of the antiskid device can be checked while the vehicle is at rest.

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**3,745,523**

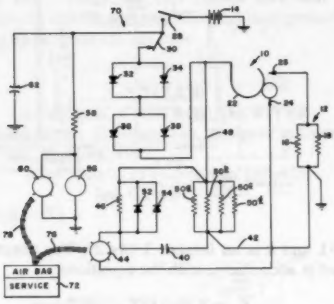
## DIAGNOSTIC SYSTEM FOR INFLATABLE SAFETY BAG FIRING CIRCUIT

**Donald J. Lewis, Troy, Mich.; William Gordon, Knoxville, Tenn., and Robert W. Wulbrecht, Utica, Mich., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed Oct. 20, 1971, Ser. No. 190,861**
**Int. Cl. B60r *21/00***
**U.S. Cl. 340—52 R** **7 Claims**

A circuit for firing the gas generating system of an inflatable safety bag device includes a capacitor which is charged from the battery at such time as the ignition switch is closed. A light emitter is connected to the capacitor so as to be energized during the charging of the capacitor. A sensor detects output from this light and controls the energization of a second light emitter. In the event the first light emitter emits light following

the closure of the ignition switch, indicating proper operation of the circuitry, the second light emitter will be deenergized. Fiber optic bundles lead from both of the light emitters to a visual indicator assembly mounted on the dashboard of the




vehicle. An alternate embodiment of the invention employs only a single light emitter diode which is normally energized and is deenergized in the event an inductive sensing means does not detect the proper operation of the charging circuitry.

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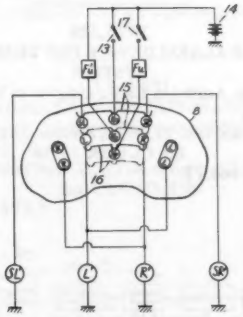
**3,745,524**

## COMBINED DIRECTION, PARKING AND HAZARD WARNING SIGNALING APPARATUS

**Masaru Suzuki, Mekikai-gun, Aichi-ken, Japan, assignor to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan**

**Filed Sept. 28, 1971, Ser. No. 184,412**
**Claims priority, application Japan, Oct. 6, 1970, 45/99433**
**Int. Cl. B60q *1/38***
**U.S. Cl. 340—76** **5 Claims**



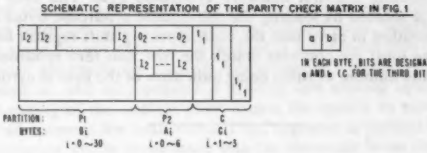

A combined switching apparatus in an automotive vehicle for direction, parking and hazard warning signaling purposes, which is characterized in that when a turn signaling lamp on either side of the vehicle is actuated, the electric circuit for an indicator or parking lamp on the corresponding side is disconnected so as to make the indication of turn of the vehicle by said lamp more distinct, and further in that when the left and right turn signal lamps are simultaneously flashed for hazard warning purposes, electric circuits for energizing the parking lamps are all disconnected so as to make the simultaneous flashing of the left and right turn signaling lamps for hazard warning purposes more distinct.

**3,745,525**

## ERROR CORRECTING SYSTEM

**Se J. Hong, Poughkeepsie, and Arvind M. Patel, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 15, 1971, Ser. No. 208,258**
**Int. Cl. H04l *1/10*; G08c *25/00***
**U.S. Cl. 340—146.1 AL** **9 Claims**


SCHEMATIC REPRESENTATION OF THE PARITY CHECK MATRIX IN FIG. 1
IN EACH BYTE, BITS ARE DESIGNATED AS a AND b (C FOR THE THIRD BIT OF C3)
PARTITION:
BYTES:

An error correcting system is provided for information sequences divided into bytes of *b* bits each. The information is encoded in accordance with an H matrix consisting of a predetermined number of submatrices, each of which operates on distinct partitioned portions of the sequence of message bytes. Each of the submatrices are concatenated iteratively by *b* so that the submatrices can be designated by $H_{r,b}$; $H_{(r-b),b}$; $H_{(r-2b),b}$ . . . $H_{(2b+c),b}$ where $r=kb+c$ and $0 \geq c<r$. Bytes of check bits are generated in accordance with the H matrix and are added to the message sequence before utilization. A syndrome is generated from the information, after it is utilized, in accordance with said H matrix and, after being decoded, generates error pointers which indicate which of the bits in a byte of the message sequence are in error. The bits identified as being in error are corrected.

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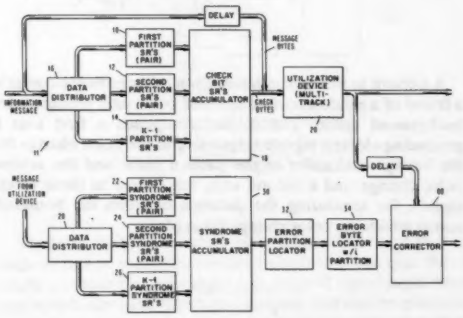
**3,745,526**

## SHIFT REGISTER ERROR CORRECTING SYSTEM

**Se J. Hong, Poughkeepsie, and Arvind M. Patel, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 20, 1971, Ser. No. 209,964**
**Int. Cl. G06f *11/12***
**U.S. Cl. 340—146.1 AL** **10 Claims**




An error correcting system is provided for a parallel track or parallel channel information handling system in which the information is divided into blocks of bytes of b-bits each. The information is encoded by attaching a plurality of check bytes in accordance with an H matrix consisting of a predetermined number of submatrices, each of which operates on distinct partitioned portions of the message bytes. Each of the submatrices are concatenated iteratively by b so that the matrix H can be designated by submatrices $H_{r,b}$; $H_{(r-b)}$ , $_b$; $H_{(r-2b)}$ $_{,b}$ . . . $H_{(2b+c)}$ $_{,b}$ where $r=kb=c$ and 0 $c<r$. Each partitioned portion of the message is operated on by a pair of shift registers to

generate the check byte contribution of the respective partition. Each pair of shift registers operates on the bits of a byte in parallel and the shift registers in each partition operate in unison. The partial check bytes from the respective pairs of shift registers are modulo 2 added to obtain the check byte. Likewise, a pair of shift registers are associated with each partition of the information so that the partial syndrome byte outputs can be modulo 2 added with the respective check bits to obtain the syndrome byte. The partition in error is determined by detecting the first non-zero syndrome byte. The byte in error is located by loading the subsequent syndrome bytes of the partition in error into the corresponding shift register and shifting until the contents match the first non-zero syndrome byte, the number of shifts being indicative of the byte in error.

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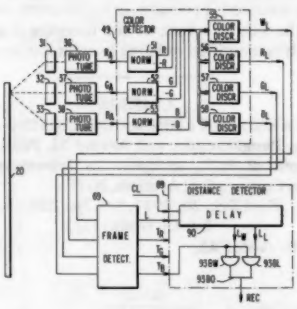
**3,745,527**

## ELECTROOPTICAL DEVICE FOR DISCRIMINATING A PREDETERMINED PATTERN FROM OTHERS BY DETECTING PRESELECTED COLOR CHANGES IDENTIFYING THE PATTERN

**Shoichiro Yoshimura; Rinzou Ebukuro, and Tomoyuki Isono, all of Minato-ku, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed Dec. 7, 1971, Ser. No. 205,666**
**Claims priority, application Japan, Dec. 9, 1970, 45/108525**
**Int. Cl. G06r *7/00*; G01j *3/34***
**U.S. Cl. 340—146.3 B** **7 Claims**




A pattern to be discriminated from other patterns comprises a frame of a predetermined size and color on a predetermined background color. The device comprises a first unit for producing electric signals responsive to the color change from the background color to the pattern color and the reversed color change and a second unit, responsive to these electric siganls, for measuring the distance between the boundaries across which the color change takes place.

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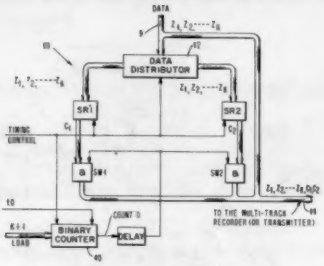
**3,745,528**

## ERROR CORRECTION FOR TWO TRACKS IN A MULTI-TRACK SYSTEM

**Arvind Motibhai Patel, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 27, 1971, Ser. No. 212,544**
**Int. Cl. G06f *11/12***
**U.S. Cl. 340—146.1 AL** **12 Claims**

A system for correcting two tracks in error in a multi-track data arrangement is provided. The message data $Z_1, Z_2, \ldots Z_k$ is encoded by adding two check bytes $C_1$ and $C_2$ thereto which are generated from the message data which is arranged in blocks of $k$ bytes, where each byte has $f$ bits of data arranged in a cross track direction, where $f=b\times m$ and $m$ and $b$ are integers $>1$ and $k$ is an integer $2<k<2^b$. The check bytes are generated in accordance with the equations:




$$C_1 = Z_1 \oplus Z_2 \oplus Z_3 \ldots \oplus Z_k$$

and

$$C_2 = T^{\lambda} \quad Z_1 \oplus T^{2\lambda} \quad Z_2 \oplus \ldots \oplus T^{k\lambda} \quad Z_k$$

where $T$ is the companion matrix of a binary primitive polynomial $g(x)$ of degree $f$ and $\lambda$ is an integer given by the expression:

$$t(2^f-1)/(2^b-1)$$

in which $t$ is any positive integer prime to $2^b-1$. The encoded message is decoded after usage (indicated by the $'$ symbol) by first and second shift registers which generate first and second syndromes from the encoded data in accordance with the equations:

$$S_1 = C_1' \oplus Z_1' \oplus Z_2' \oplus \ldots \oplus Z_k'$$

$$S_2 = C_2' \oplus T^{\lambda} \quad Z_1' \oplus T^{2\lambda} \quad Z_2' \oplus \ldots \oplus T^{k\lambda} \quad Z_k'$$

Error pointers are provided for indicating the tracks in error and the bytes in error in the indicated tracks are corrected in accordance with the error patterns generated by processing the syndromes.

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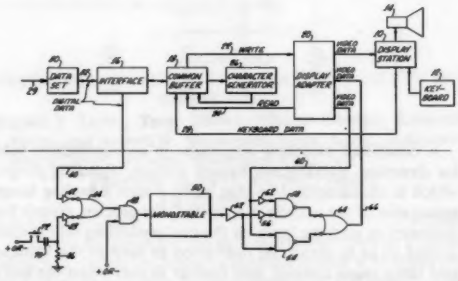
**3,745,529**

## TROUBLE ALARM DEVICE FOR TRANSMISSION SYSTEM

**Roger E. Engle, Anaheim, Calif., assignor to Trivex Inc., Costa Mesa, Calif.**

**Filed Dec. 27, 1971, Ser. No. 212,574**
**Int. Cl. G08c *25/00***
**U.S. Cl. 340—146.1 E** **11 Claims**




In association with a data terminal having provision for receiving or locally generating data signals and translating the signals into video signals to cause the symbols represented by

the signals to be displayed on a cathode ray tube, a communication channel assurance system is disclosed. The system comprises a video signal inversion device controlled by a timer that monitors the communication channel for the presence of incoming data signals. Such signals repetitiously recycle the timer, but upon a cessation of signals for a predetermined interval the timer times out and causes inversion of video signals, thereby reversing the symbol and background tones of the display on the cathode ray tube.

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**3,745,530**

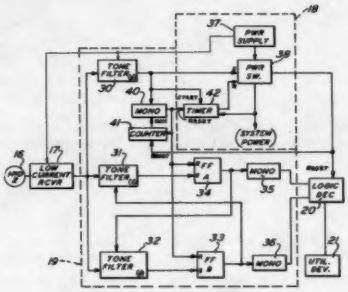
**ACOUSTIC CONTROL RECEIVER**

**Richard Jan Carman, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.**

**Filed June 7, 1971, Ser. No. 150,425**

**Int. Cl. H04g** *9/00*

**U.S. Cl. 340—171 A** **8 Claims**




An acoustical control receiver is disclosed for receiving and responding to a transmitted coded acoustic signal having a plurality of space tones at one acoustic frequency with a data tone of a different acoustic frequency between successive space tones to provide control of an utilization device. The receiver includes an input circuit that receives the transmitted coded signal and responds to the space tones to turn on detecting and decoding means connected to the input means to detect and decode the data tones and provide a control signal for controlling the utilization device when a proper sequence of space tones is received and a proper sequence of data tones is decoded.

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**3,745,531**

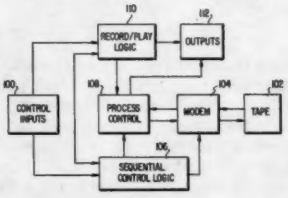
**RANDOM ACCESS TAPE MACHINE**

**Philip C. Staas, Jr., Malvern, Pa., assignor to Control Sciences, Inc., Malvern, Pa.**

**Filed Nov. 25, 1970, Ser. No. 92,819**

**Int. Cl. G11b** *5/00*

**U.S. Cl. 340—172.5** **54 Claims**




A digitally controlled magnetic tape system provides storage and retrieval of information in accordance with random accessing and affords branching within the program recorded on the tape. Both random accessing and branching operations are performed at high speed for either forward or reverse directions of tape drive to position the tape at a desired, specified address. The digital control also affords ancillary control functions for providing synchronized operation of external devices, such as visual aids, in replay of the tape. The system provides both for the preparation of a programmed tape and automatic playback of that tape in accordance with the recorded program and in response to various input controls coordinated with the program. The system has particular application as a teaching machine wherein an instructor may record a lecture, a question, and multiple choice answers. An evaluation of each proposed answer may then be recorded, with a corresponding control word. Selection of a given answer choice by a student in subsequent play operations automatically presents the instructor's comment to the student, and may provide a grading and scoring operation. Reading of the control word causes the system to automatically present the next instructional segment as defined by the program, and in accordance with the automatic branching and random accessing capabilities of the system. Manual control of the play operation is provided, such as random accessing, to select a tape position for initiation of the program and to permit repeat of questions, while assuring proper operation of the machine in accordance with the desired program.

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**3,745,532**

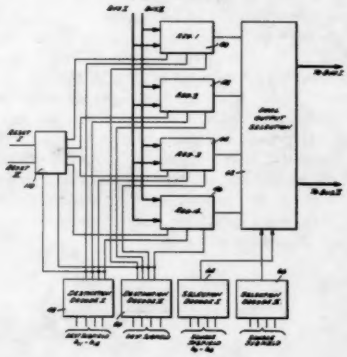
**MODULAR DIGITAL PROCESSING EQUIPMENT**

**Floyd Dennis Erwin, Brea, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed May 27, 1970, Ser. No. 41,040**

**Int. Cl. G06f** *13/00*

**U.S. Cl. 340—172.5** **16 Claims**

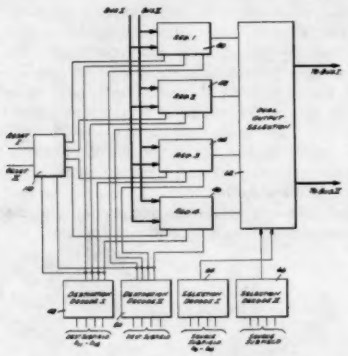


Modular digital processing equipment of the type that can include one or more functional characters of the type that include an input bus, an output bus, control signal input means and which can have inputs and outputs that can be connected to similar or other characters for modular expansion of the operational capabilities. The functional characters including: a modular register character which provides storage for operands of a micro-program; a general logic character that performs basic logic functions for use by the micro-program; an arithmetic logic character that provides major arithmetic functions for use by the micro-program; an input/output character that provides input/output interface to the micro-program machine; a micromemory counter character that provides micromemory address registers and related functions; a micro-instruction register that contains the micromemory word registers; and a micro-array character that contains a micromemory array.

## 3,745,533
## DIGITAL DATA STORAGE REGISTER MODULES

Floyd Dennis Erwin, Brea, and William S. Postma, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 27, 1970, Ser. No. 41,039
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 3 Claims



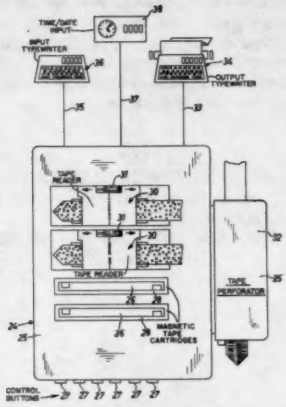
Digital data storage register modules for a of the type that can include one or more functional characters of the type that include an input bus, an output bus, control signal input means and which can have inputs and outputs that can be connected to similar or other characters for modular expansion of the operational capabilities. The functional characters including: a modular register character which provides storage for operands of a micro-program; a general logic character that performs basic logic functions for use by the micro-program; an arithmetic logic character that provides major arithmetic functions for use by the micro-program; an input/output character that provides input/output interface to the micro-program machine; a micromemory counter character that provides micromemory address registers and related functions; a micro-instruction register that contains the micromemory word registers; and a micro-array character that contains a micromemory array.

## 3,745,534
## APPARATUS FOR SELECTIVELY COUPLING ELECTRICAL SIGNALS AND SCANNING AND RECORDING DEVICES TO MOVABLE DATA CARRIERS

Peter Frutiger, Wangen near Dubendorf, and Rolf Schuler, Cham, both of Switzerland, assignors to Anstalt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Filed Dec. 9, 1970, Ser. No. 96,301
Claims priority, application Switzerland, Dec. 11, 1969, 18466/69
Int. Cl. G06f *3/08;* G11b *13/00*
U.S. Cl. 340—172.5 5 Claims

Apparatus for selectively inputting, transcribing and reading out to and from moving data carriers, comprising a moving magnetic film carrier having at least one recording and read-out mechanism, with feed means serving to advance the magnetic film carrier. Series-parallel converter means and switch means serve to selectively connect the recording and read-out mechanism with at least one scanner device for perforated information carriers as well as with at least one input or output location for electrical signals. There is also present means for

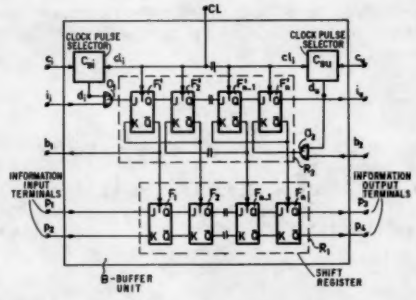


driving the series-parallel converter means substantially in synchronism with the feed means for the magnetic film carrier.

## 3,745,535
## MODULAR SYNCHRONOUS BUFFER UNIT FOR A BUFFER HAVING A CAPACITY DEPENDING ON THE NUMBER OF INTERCONNECTED IDENTICAL BUFFER UNITS

Oscar Bernardus Philomenus Rikkert DeKoe, and Arnold Jan Bijker, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1971, Ser. No. 186,705
Claims priority, application Netherlands, Oct. 8, 1970, 7014737
Int. Cl. G11c *19/00*
U.S. Cl. 340—172.5 1 Claim




A synchronous buffer unit module which includes a shift register, a bookkeeping register and two clock pulse selectors. An internal clock pulse generator operates at a frequency *n* times the average frequency of information input and information output devices. The shift register contains n stages each controlled by an output of the bookkeeping register. During the period when information is stored in the shift register the bookkeeping register is controlled selectively either by a combination of the internal clock pulses and the clock pulses of an external information source through one of the clock pulse selectors, or in the case where the unit forms a buffer stage subsequent to the first buffer stage of a buffer assembly by pulses from the last stage of the bookkeeping register in a preceeding buffer unit. During the output period of the buffer

unit the bookkeeping stage is controlled through a second clock pulse selector by the internally generated clock pulses and the clock pulses from an external unit to which the information in the buffer is to be transmitted or, in the case where the unit preceeds the last unit in a buffer assembly of such buffer units, by a signal derived from the first stage of a bookkeeping memory in the next subsequent buffer unit.

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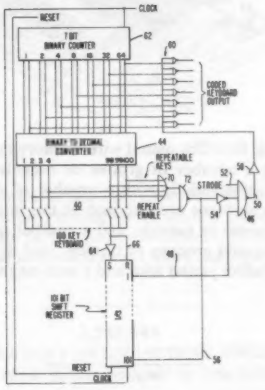
**3,745,536**

## HIGH SPEED SERIAL SCAN AND READ-OUT OF KEYBOARDS

**William G. Klehm, Jr., Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Mar. 1, 1971, Ser. No. 119,490**
**Int. Cl. G11c** *19/00*
**U.S. Cl. 340—172.5** **18 Claims**




Relates generally to the production of electrical signals from a keyboard, each key of which is individually operatively associated with a switching device whose activation to electrical conductive condition is controlled by the displacement of the key. These switches are hermetically sealed from the atmosphere and are electrically scanned in succession at relatively high speeds and at a repetitious rate such that several scanning cycles occur during the normal activation of a selected key. The keyboard mechanism also includes a shift register having one more bit position than the number of switch devices and into which a bit is introduced into the "one" position at the instant the scan encounters a closed switch of the keyboard. This bit is then shifted through the register in timed relation to the scan of the remaining key switches and unloaded into the last bit position of the register. A detector senses the presence of a bit in both the "one" position and the last position of the shift register and upon detection of a bit solely in the one position it delivers a signal indicative of the character represented by the actuated key and upon detecting bits in the two extreme positions of the shift register it nullifies the delivery of such a signal.

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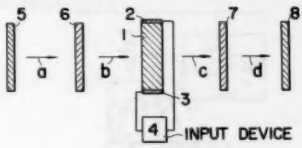
**3,745,537**

## MEMORY ELEMENTS UTILIZING GYROELECTRIC SUBSTANCE AND METHOD OF OPERATING SAME

**Keichiro Aizu, Tokyo, Japan, assignor to Kabushiki Kaisha Hitachi Seisakusho, Tokyo-To, Japan**

**Continuation-in-part of Ser. No. 370,439, May 27, 1964, abandoned. This application May 3, 1971, Ser. No. 139,925**
**Int. Cl. G11c** *11/00, 11/22*
**U.S. Cl. 340—173 R** **17 Claims**

A memory element utilizing the unique phenomenon of a gyroelectric substance wherein the hysteresis characteristics of field as against electric gyration has two states of mutually opposite code of electro-gyration under the condition of the electric field being zero. Information is stored in this memory element with one of the states of electro-gyration being "1" and the other "0", then linear polarized light is irradiated onto this gyroelectric substance to detect the rotational angle of the




vibrating surface of the light passing through this material, thereby reading out information stored in this gyroelectric material. The memory element is used in connection with writing-in and reading-out, with a light switch, and with a logical operation apparatus.

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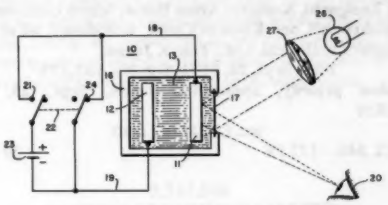
**3,745,538**

## BISTABLE OPTICAL DEVICE

**Donald Jex Sharp, Lawrence Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.**

**Filed June 1, 1971, Ser. No. 148,516**
**Int. Cl. G11c** *13/02*
**U.S. Cl. 340—173 CH** **9 Claims**




A bistable optical display device comprising a reflective anode, such as silver, and a metal cathode, such as zinc, immersed in a caustic electrolyte, such as potassium hydroxide. Application of a "turn-on" voltage of approximately 1.5 volts causes a chemical reaction such that the reflective anode turns substantially non-reflective. This condition persists even if the "turn-on" voltage is removed and the cell will return to its original state only if the anode and cathode are shorted together.

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**3,745,539**

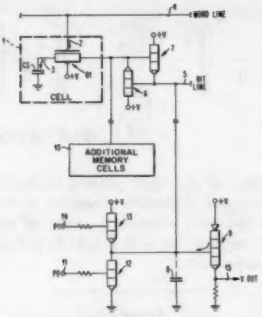
## LATCH TYPE REGENERATIVE CIRCUIT FOR READING A DYNAMIC MEMORY CELL

**Evan E. Davidson, Hopewell Junction; Ralph D. Lane, Wappingers Falls, and Jerry Saia, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 20, 1972, Ser. No. 235,897**
**Int. Cl. G11c** *11/40*
**U.S. Cl. 340—173 R** **6 Claims**

A semiconductor device circuit for reading an FET capacitor store dynamic memory cell and for regenerating the charge (if any) in said capacitor whereby non-destructive read-out is achieved. The memory cell includes an FET switch for selectively connecting the storage capacitor to a memory array bit-sense line through either one of a pair of oppositely connected bipolar transistors for reading and writing, respectively. The bit-sense line is connected to the input terminal of a latching regenerative feedback amplifier such as a silicon controlled rectifier. The potential level at said input terminal rises to a relatively higher level by regenerative feedback action in response to a relatively lower bit-sensing voltage which initiates the latching action. The storage capacitor of the

memory cell is recharged via one of the bipolar transistors in response to the aforesaid relatively higher potential at the the amplifier input terminal. Bipolar current switch embodiments




as well as a silicon controlled rectifier embodiment are disclosed for instrumenting the latching regenerative feedback amplifier.

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**3,745,540**

## SEMICONDUCTOR MEMORY

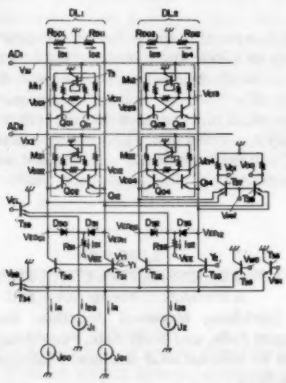
**Kenji Taniguchi, Kodaira; Atsuo Hotta; Ichiro Imaizumi, both of Kokubunji, and Kouetsu Chiba, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sept. 24, 1971, Ser. No. 183,375**

**Claims priority, application Japan, Sept. 25, 1970, 45/83850**

**Int. Cl. G11c *11/40***

**U.S. Cl. 340—173 FF** **29 Claims**



A switched impedance element, presenting a high or a low impedance value in response to whether or not an address voltage is applied thereto, is connected with each collector of a pair of transistors which are mutually coupled together in such a manner that the collector and the base of one transistor are connected with the base and the collector of the other transistor, respectively, to thereby form a memory cell. A pair of digit lines are connected with the emitters of the pair of transistors and an address line is connected with the switched impedance elements connected with the respective collectors. The address voltage is superposed on a collector bias voltage and applied to the address line when the memory cell is to be selected, whereby the low impedance is loaded on each of the collectors of the pair of transistors when the are selected.

**3,745,541**

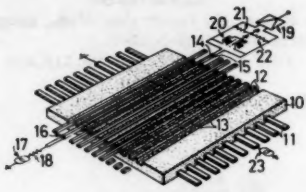
## MAGNETIC THIN FILM PLATED WIRE MEMORY

**Seihin Kobayashi; Michihiro Torii, and Takehiko Jojima, all of Shizuoka-Ken, Japan, assignors to Fuji Electrochemical Co., Ltd., Shizuoka-ken, Japan**

**Filed Apr. 7, 1972, Ser. No. 242,076**

**Int. Cl. G11c *11/04, 11/14***

**U.S. Cl. 340—174 PW** **10 Claims**




A magnetic thin film plated wire memory comprises a fixed plate having a number of groove or tunnels intersecting at right angles substantially with a number of embedded word wires whose surfaces are exposed at the intersecting points with said grooves or tunnels, and a number of digit wires arranged in the said grooves or tunnels, said digit wire being a magnetic thinfilm plated wire and a non-magnetic conductive wire.

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**3,745,542**

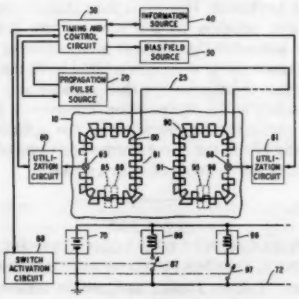
## METHOD AND APPARATUS FOR SELECTIVELY ACCESSING A SERIAL STRING OF ENHANCED PROPAGATION PULSE WRITE CIRCUITS

**John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed July 25, 1972, Ser. No. 274,864**

**Int. Cl. G11c *11/14, 19/00***

**U.S. Cl. 340—174 TF** **9 Claims**

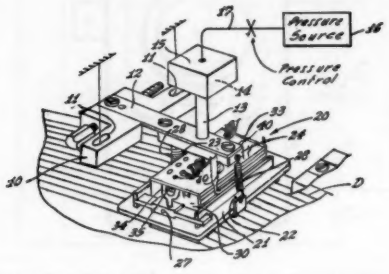



Selected write circuits in a serial string of enhanced propagation pulse write circuits are activated by modulating the magnetic bias fields in the local vicinity of the selected circuits a sufficient amount to cause only the selected circuits to respond to enhanced propagation pulses, which are normally of insufficient amplitude to activate any of the write circuits.

## 3,745,543
## SUSPENSION AND MOUNTING OF TRANSDUCER HEADS USING RESILIENT SPACERS TO POSITION HEAD

Wayne Jay King, Leucadia, Calif., assignor to Pacific Micronetics, Inc., San Diego, Ca[2]f.

Filed June 15, 1970, Ser. No. 46,250
Int. Cl. G11b 5/60, 21/20
U.S. Cl. 340—174.1 E 7 Claims

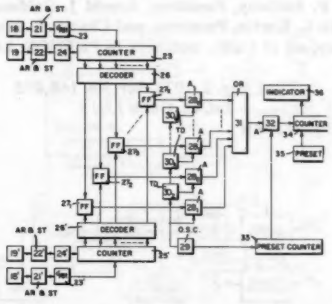



A "flying" transducer head is mounted in relation to a hard surface (disc or drum) through a retractable gimbal with pitch and roll positions of the head established through resilient spacers free from stress and strain when the head rests on the surface.

## 3,745,544
## APPARATUS FOR MEASURING ANGLES

Giichiro Ono, Tokyo, Japan, assignor to Ono Sokki Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1971, Ser. No. 192,199
Claims priority, application Japan, Nov. 5, 1970, 45/97363
Int. Cl. G08c 19/16
U.S. Cl. 340—206 4 Claims




Apparatus for digitally measuring the angle of rotation of a shaft is provided including first, second, third and fourth discs mounted for rotation on a common shaft or axis and cooperating first, second, third and fourth electromagnetic pickups mounted facing each of the exterior circumferences of the first, second, third and fourth discs, some of the pickups are fixed with respect to their complementary rotating discs and the others are rotated an amount corresponding to the rotating angle to be measured and circuit means including pulse signal generators, counters, gates and decoders for digitally measuring the angle of movement of the rotatably mounted electromagnetic pickups.

## 3,745,545
## TEMPERATURE LIMIT ALARM

Rolf E. Darbo, P. O. Box 2158, Madison, Wis.

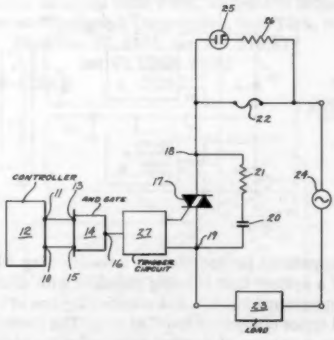
Filed May 15, 1972, Ser. No. 253,183
Int. Cl. G08b 17/06
U.S. Cl. 340—227.1 9 Claims

A bimetal temperature responsive coil exposed to ambient atmosphere is connected at its fixed inner end to one battery terminal and adjustable contact elements in the form of arches enclosing a lamp are connected to the other terminal to be contacted by the tail of the coil as it moves in response to temperature change to either the lower or the upper limit.

## 3,745,546
## CONTROLLER OUTPUT CIRCUIT

Odo J. Struger, Milwaukee, and Jay M. Erdman, South Milwaukee, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed June 7, 1971, Ser. No. 150,487
Int. Cl. G08b 21/00
U.S. Cl. 340—250 5 Claims

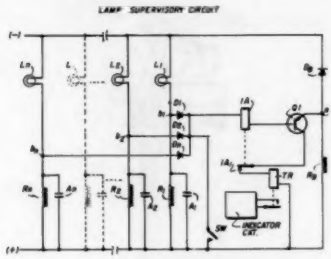



An output drive circuit for a programmable controller includes a triac connected to an a-c power supply in series with a fuse and the controlled external load. The fuse is shunted by a neon indicator lamp and the triac is shunted by a high impedance path including a resistor and capacitor. When the fuse blows and the triac is turned off the the controller, current flows through the neon bulb to indicate the faulty fuse.

## 3,745,547
## LAMP SUPERVISORY CIRCUIT

Walter Robert Hadank, Springfield, Mass., assignor to Standard Electric Time Corporation, Springfield, Mass.

Filed June 22, 1972, Ser. No. 265,149
Int. Cl. G08b 21/00
U.S. Cl. 340—251 10 Claims

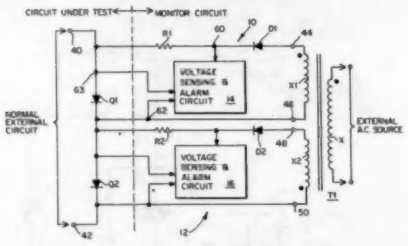



A lamp supervisory circuit for detecting failure of at least one indicator lamp includes a branch circuit including the indicator lamp and a resistor connected in series across a source of potential permitting a trickle current to flow through the lamp normally providing a voltage at a first level at the junction point of the indicator lamp and the resistor, a voltage at a second level being provided at the junction point upon failure of the lamp, and monitoring apparatus connected to the junction point which is responsive to a voltage at the second level to enable a fault indicating circuit to indicate failure of the lamp; switch apparatus connected in parallel with the resistor is operable to short out the resistor by extending a voltage at a third level to the junction point, thereby effecting illumination of the indicator lamp; the monitoring apparatus including a relay enabled whenever a voltage at the third level is provided at the junction point to inhibit the enabling of the fault indicating circuit.

## 3,745,548
## DIODE MONITORING SYSTEMS

Jon V. Skelton, and Alfred E. Relation, both of Philadelphia, Pa., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Sept. 28, 1971, Ser. No. 184,347
Int. Cl. G08b 21/00
U.S. Cl. 340—253 E 4 Claims

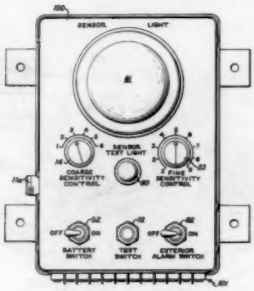



An apparatus for monitoring a rectifier leg which forms a part of a system that is being supplied with electrical power from an external circuit. The rectifier leg has at least first and second series connected rectifier cells. The monitor apparatus includes a source of control power for supplying electrical power to the monitor apparatus as well as to the rectifier leg. The monitor apparatus provides an indication of open and short circuit failure of the rectifier cells while they are in use in the system and being supplied with electrical power from the external circuit or while they are being supplied with electrical power solely by external circuit or while they are being supplied with electrical power solely by the source of control power of the monitor apparatus.

## 3,745,549
## PROXIMITY ALARM

Richard M. Jepperson, and C. Warren Simmonds, both of Salt Lake City, Utah, assignors to Crane Products Manufacturing Co., Inc., Las Vegas, Nev.

Filed Apr. 19, 1971, Ser. No. 135,347
Int. Cl. G08b 13/26
U.S. Cl. 340—258 C 21 Claims

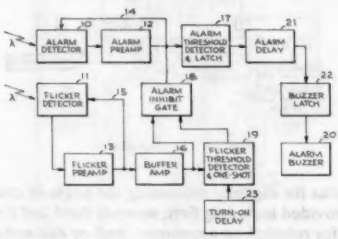



A control device in a proximity alarm system gives warning when an object enters an electrostatic field located around an energized power line. The alarm system itself comprises antenna means for sensing the presence of the electrostatic field thereby inducing an alternating current potential therein. A switching circuit and an induced signal control circuit are electrically connected to each other. The switching circuit includes antenna sensitivity control, test circuitry and alarm circuitry. The induced signal control circuit includes amplifier means, half-wave voltage doubling means, oscillating means, power supply voltage regulating means and frequency filtering means. In a specific embodiment, the switching circuit and the induced signal control circuit are located in a casing composed of a non-magnetic material. The induced signal control circuit is encapsulated in a resinous material and is removably mounted within the casing.

## 3,745,550
## OPTICAL INTRUSION ALARM SYSTEM

Michael P. Anthony, Pasadena; Arnold J. Goldman, Encino; Stephen L. Kurtin, Pasadena, and Charles E. Mullett, Playa Del Rey, all of Calif., assignors to PHENOS, Los Angelos, Calif.

Filed Aug. 2, 1971, Ser. No. 168,075
Int. Cl. G08b 13/18
U.S. Cl. 340—258 B 11 Claims

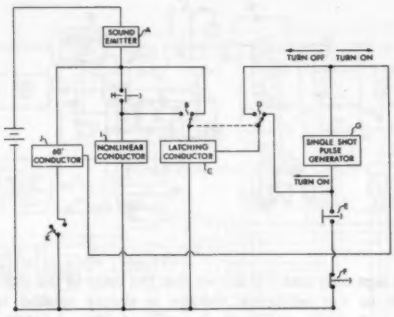



An optical intrusion alarm system employs two photoconductive detectors with regulating feedback to continually adapt the system to changing ambient light. One detector is used to produce an alarm in response to small changes in light caused by movement of an intruder, and the other detector is used to inhibit the first from producing an alarm in response to ambient light transients.

## 3,745,551
## ALARM APPARATUS AND METHOD

Lyle Douglas Smith, 3400 Carlyn Spring Road, Falls Church, Va.

Filed Aug. 12, 1970, Ser. No. 63,111
Int. Cl. G08b *13/08*
U.S. Cl. 340—276 16 Claims

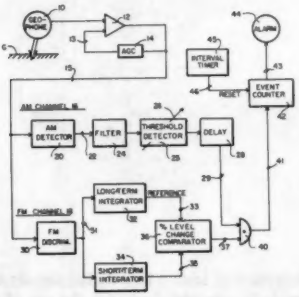



A portable or fixed service alarm device that clamps onto a door, wherein: when occupant is absent, the violated alarm sounds each time the door is opened for 60 seconds and then shuts off; provides an unobvious indication of a past violation from the outside of the door; when occupant is present, the sound cannot be quieted without a key; at all times, a doorbell is present, but not attached, at the outside of the door for the convenience of anyone wishing to gain admittance.

## 3,745,552
## INTRUSION SIGNATURE DETECTOR REQUIRING BOTH FREQUENCY AND AMPLITUDE SHIFTS

Marvin Duane Wilt, Dallas, Tex., assignor to Teledyne Industries, Inc. (Geotech Division), Dallas, Tex.

Filed Sept. 13, 1971, Ser. No. 179,641
Int. Cl. G08b *13/00*
U.S. Cl. 340—261 2 Claims

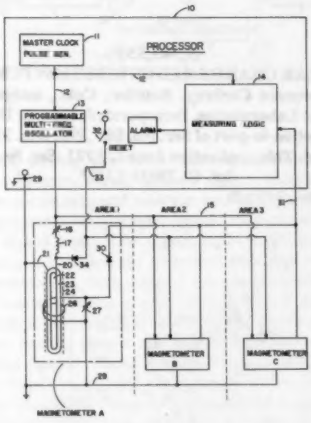



An intrusion detector system which uses a geophone to sense both ambient environmental events and man-made cultural events, the system being responsive to the combination of changes both in the amplitude and in the frequency of the waveform signature picked up by the geophone to detect intrusions characterized by man-made events superimposed upon ambient events. An AM detector channel responds to changes in amplitude of the geophone output waveform, and an FM discriminator channel responds to shifts in its momentary frequency, these latter shifts being stored both in a long-term integrator and in a short-term integrator whose contents are continuously compared to determine when short-term conditions begin changing as compared with averaged long-term conditions, the latter representing mainly environmental noise. When at the same time both channels respond beyond certain preset threshold levels the system delivers outputs, and these outputs can either directly set off alarms or else a certain number of outputs can be counted before an alarm results thereby tending to reduce the liklihood of false alarms.

## 3,745,553
## SINGLE SOURCE SEVERAL SENSOR SECURITY SYSTEM

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 6, 1971, Ser. No. 205,085
Int. Cl. G08b *13/24, 25/00*
U.S. Cl. 340—276 7 Claims

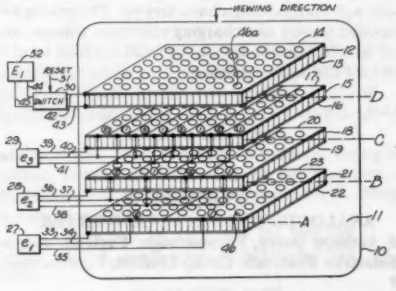



A single source several sensor security system in which a plurality of magnetometer sensors report back through a common circuit to a processor which will process the outputs of the several units. The magnetometer sensors are designed to be frequency selective so that each sensor responds to an individual frequency of drive excitation.

## 3,745,554
## MICROCHANNEL PLATE GAS DISPLAY PANEL

John M. Grant, Granada Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,877
Int. Cl. H05b *37/02*
U.S. Cl. 340—324 R 7 Claims




A randomly addressed neon glow display panel shown in linear form. The system is particularly adapted to the display of digitally presented information, and includes a channel plate corresponding to each digit of significance in a digital

word to be presented. The least significant digit is applied to a channel plate divided into two electrode surface areas. Each succeedingly more significant digit is supplied to a channel plate divided with the number of discrete surface electrodes areas increasing progressively according to a power (i.e., scale of two). These channel plates are stacked with insulating channel plates between them, all channels being aligned or in spatial registration throughout the "sandwich".

The entire assembly of channel plates is contained in a closed vessel containing neon gas in a quantity and pressure appropriate for obtaining glow discharge effect. Ignition transfer between plates is employed to obtain a discrete area of glow on a viewing channel plate arranged to respond to the glow stimulus from the aforementioned sandwich of plates.

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**3,745,555**

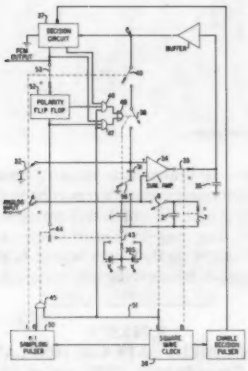
## NONLINEAR CHARGE REDISTRIBUTION PCM CODER

**Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation-in-part of Ser. No. 889,398, Dec. 31, 1969, abandoned. This application June 1, 1971, Ser. No. 148,313**

**Int. Cl. H03k** *13/02*

**U.S. Cl. 340—347 AD** **9 Claims**




A circulating pulse code modulation (PCM) encoder utilizes capacitive charge redistribution techniques to obtain a hyperbolic self-companding characteristic. The analog sample to be encoded is used as a charging reference voltage, and, by means of an offset bias source, a zero volt decision level forms the basis for PCM signal emission.

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**3,745,556**

## ANALOGUE TO DIGITAL CONVERTER

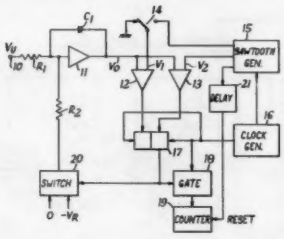
**Howard Anthony Dorey, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England**

**Filed May 7, 1971, Ser. No. 141,340**

**Int. Cl. G01r** *17/00, 17/02*; **H03k** *13/24*

**U.S. Cl. 340—347 AD** **16 Claims**

In an analogue to digital converter the unknown voltage is applied continuously to an integrating circuit during each conversion period. An opposing reference voltage is switched on and off to cause the amplifier output to ramp up and down between two detection levels. One or both of these levels varies as a periodic function of time, e.g. a sawtooth waveform. Clock pulses are counted when the slope of the output ramp is




of one sign only and it is shown that the ratio of the unknown voltage to the reference voltage is simply related to the number of clock pulses actually counted when the slope is of said one sign and the total number of clock pulses occurring during one conversion period.

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**3,745,557**

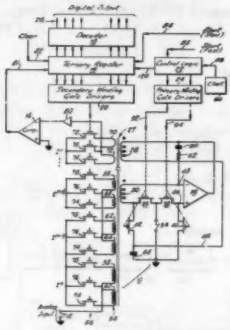
## ANALOG-DIGITAL AND DIGITAL-ANALOG CONVERSION DEVICE AND METHOD

**Roswell W. Gilbert, New York, N.Y., assignor to Technical Management Services, Inc., Westfield, N.J.**

**Division of Ser. No. 6,075, Jan. 27, 1970, Pat. No. 3,626,292. This application Sept. 27, 1971, Ser. No. 184,026**

**Int. Cl. H03r** *13/02*; **G08c** *1/00*

**U.S. Cl. 340—347 AD** **38 Claims**

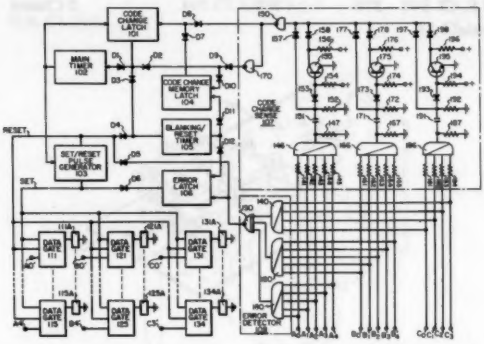


The conversion of analog into digital signals and digital into analog signals is accomplished with the use of a signal transformer device which produces multiple output voltages whose values vary in accordance with a digital code. Each voltage is a precise multiple of a signal input to the transformer. In the transformer device, means are provided for repeatedly reversing the connections of the input terminals to the primary winding of a transformer, and means are provided for causing the magnetic flux in the core of the transformer to excursion symmetrically below saturation level, thus enabling operation with DC input signals. In the conversion of analog signals into digital signals, there is used a successive approximation method in which the polarity of the correction signal is made opposite to the polarity of the error in the previous approximation of the digital signal. Each correction signal forms a part of the final digital output signal.

## 3,745,558
## DATA GUARD CIRCUIT

**Richard A. Morstadt, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.**

**Filed Feb. 28, 1972, Ser. No. 229,968**
**Int. Cl. G06f *3/00***
**U.S. Cl. 340—347 DD** **10 Claims**




A circuit providing parallel-coded format receivers with good retention of character duration information and a high degree of immunity to channel noise, speech, and other channel energy that the receiver might detect, but which violate the parallel-code format or timing restrictions.

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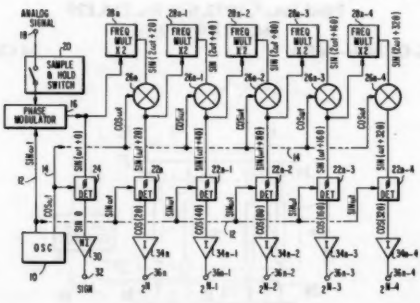
## 3,745,559
## ANALOG TO DIGITAL CONVERTER

**John Mattern, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed June 1, 1972, Ser. No. 258,600**
**Int. Cl. H03k *13/02***
**U.S. Cl. 340—347 AD** **10 Claims**

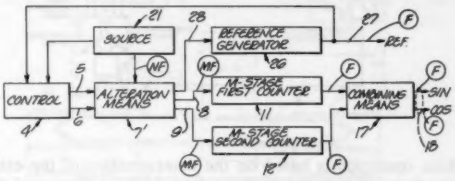



Apparatus for directly generating a cyclical multi-bit Gray code digital output by means of a plurality of identical cascaded frequency multiplier stages, each of which includes a frequency doubler, a mixer, a phase detector and a squaring amplifier, wherein the output of each frequency doubler is translated to its input frequency and phase detected against a reference carrier signal. The output of each stage when limited, provides a digitized output bit in a Gray code format.

## 3,745,560
## TRIGONOMETRIC SIGNAL GENERATOR AND MACHINE CONTROL

**Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, New York, N.Y.**

**Division of Ser. No. 864,079, Oct. 6, 1969, Pat. No. 3,686,487.**
**This application Dec. 1, 1971, Ser. No. 203,893**
**Int. Cl. H03k *13/00***
**U.S. Cl. 340—347 DA** **17 Claims**




Digital and analog converter method and apparatus for generating trigonometrically related signals suitable for use with position measuring and position controlling systems. Two or more converter analog output signals are formed as a function of the digital input. The digital input generates a digital count difference between the counts in two digital counters. The two counters are both stepped by synchronously derived stepping pulses to produce counter output signals, exhibiting a phase difference proportional to the digital count difference. The counter output signals are logically combined to form analog output signals. Those analog output signals are pulse-width modulated rectangular waveforms which each include a fundamental sinusoidal frequency component having an amplitude proportional to a trigonometric function of the digital input. The analog output signals from the converter are typically connected as inputs to a position measuring device to trigonometrically define the position between two members of the position measuring device. The position measuring device is typically an Inductosyn transducer or other data element which responsively forms an analog output signal having a magnitude which indicates the relative position of the two members. The analog output signal is typically converted to a digital signal, in the form of a train of pulses, where each pulse represents an incremental distance. That digital signal, derived from the analog output signal, is typically supplied as an input to the converter which converts the digital input to the analog output, thereby forming a closed loop system.

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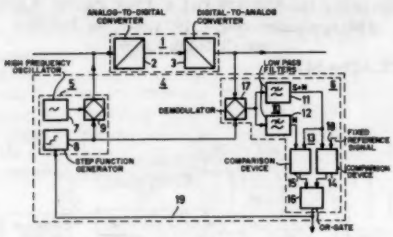
## 3,745,561
## ARRANGEMENT FOR TESTING THE CONVERSION ACCURACY OF A CIRCUIT CONSTITUTED BY AN ANALOG-TO-DIGITAL AND A DIGITAL-TO-ANALOG CONVELTER

**Leonardus Petrus Jozef Van Dijk, Hilversum; Georg Flutsch, Dietikon; Geerlof Jan Korevaar, and Jan Verhagen, both of Hilversum, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 16, 1971, Ser. No. 199,229**
**Claims priority, application Netherlands, Nov. 18, 1970, 7016852**
**Int. Cl. H03k *13/02***
**U.S. Cl. 340—347 AD** **6 Claims**

An arrangement for testing the conversion accuracy of a convertor circuit which is constituted by an analog-to-digital convertor and a digital -to-analog convertor, which arrange-

ment includes a test signal generator providing a composite test signal and in which a supervision arrangement is used




whose operation is based on the determination of the extra distortion which occurs as a result of faulty operation of the convertor circuit.

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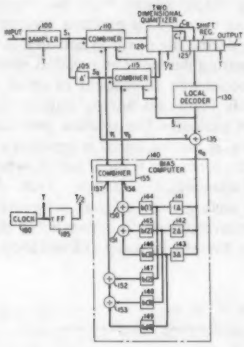
**3,745,562**

## DIGITAL TRANSMISSION SYSTEM WITH FREQUENCY WEIGHTED NOISE REDUCTION

**Arnold Stephen Rosenbaum, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 30, 1971, Ser. No. 214,051**
**Int. Cl. H03k** *13/02*
**U.S. Cl. 340—347 AD** **15 Claims**



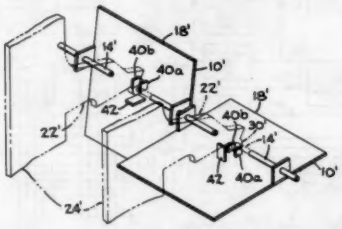

An analog-to-digital encoder uses an *N* dimensional quantizer to simultaneously generate *N* digits of the output code for an input analog signal. When the quantizer is used as a Delta modulator, the inputs to it are developed in *N* summing circuits. The first summing circuit has the present sample of the analog signal as an input and the other summing circuits have one of (*N*−1) future samples applied to their inputs, respectively. A local decoder at the output of the quantizer generates a reconstruction or approximation of the analog signal and applies it to each of the summing circuits. In addition, past error terms are stored, multiplied by weighting coefficients, and combined into signals which are also applied to the summing circuits. The proper selection of weighting coefficients and decision threshold levels in the quantizer produces an output code which has a minimum frequency weighted quantizing error.

**3,745,563**

## ARRANGEMENT FOR PRESERVING THE FREE ROTATABILITY OF THE INDIVIDUAL VANES IN COMPOSITE DISPLAY DEVICES

**Charles E. Jones, Lincolnwood, Ill., and William Ross Aiken, Los Altos Hills, Calif., assignors to Display Technology Corporation, Cupertino, Calif.**

**Filed Jan. 10, 1972, Ser. No. 216,360**
**Int. Cl. G09f** *9/30*
**U.S. Cl. 340—378** **5 Claims**




In composite display devices of the rotatable vane type wherein rows of juxtaposed vanes are rotatably supported upon common horizontally disposed axles and are selectively turned on said axles under the influence of electrostatic fields, coacting guide means are provided on the vanes and the support structure for the axles, for confining each vane during its performance to its predetermined position axially of its axle. Thus, displacement and lateral contact of adjacent vanes on the axles with resultant impairment of their free individual rotatability is prevented without need to use spacer beads between them.

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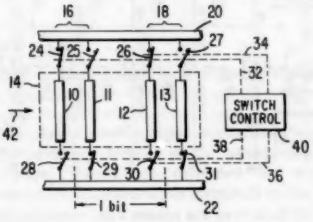
**3,745,564**

## SWITCHABLE ACOUSTIC SURFACE WAVE DEVICE

**David Anthony Gandolfo, Newbury Park; Charles Louis Grasse, Panarama City, and George Daniel O'Clock, Jr., Granada Hills, all of Calif., assignors to RCA Corporation, New York, N.Y.**

**Filed Jan. 7, 1972, Ser. No. 216,129**
**Int. Cl. H04l** *15/06*
**U.S. Cl. 340—365 A** **14 Claims**




In a switchable acoustic surface wave device, spaced conductive fingers disposed on a surface of piezoelectric material form one or more transducers therewith. The fingers are selectively and conductively interdigitized in a predetermined sequence for switchably phase-encoding the device.

3,745,565

## PANEL STRUCTURE FOR MOUNTING ELECTRICAL COMPONENTS TO PROVIDE FRONT ACCESS THERETO

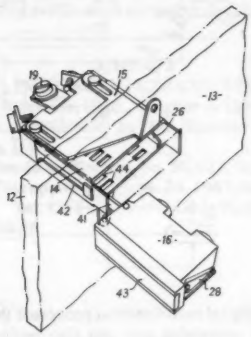
William Robert Daines, and John Anthony Cartwright, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Mar. 9, 1972, Ser. No. 233,048

Claims priority, application Great Britain, Apr. 29, 1971, 12,213/71

Int. Cl. G09f 9/14

U.S. Cl. 340—381 11 Claims




A panel mounting unit for a replaceable electrical component, e.g. a lamp or fuse link, has three main parts: a housing, to be mounted on the panel, a component holder which fits into the housing, and a latching mechanism serving to lock the holder and housing together when the holder is initially pushed into the housing, the mechanism operating to free the holder when the latter is subsequently pushed inwardly.

3,745,566

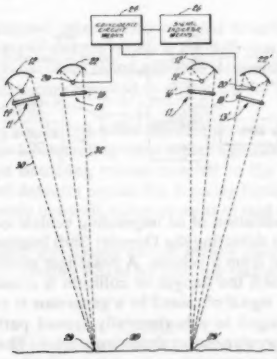
## OPTICAL RADIATION DETECTOR

Peter D. Johnson, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 14, 1962, Ser. No. 202,635

Int. Cl. G01s 9/00

U.S. Cl. 343—5 R 18 Claims



The system comprises two propagators and receivers for the detection of submarine wakes. The propagators irradiate oil films in submarine wakes thereby causing the oil to fluoresce. The fluorescent emanations from adjacent areas of the oil and detected by the receivers which provide an appropriate indication.

3,745,567

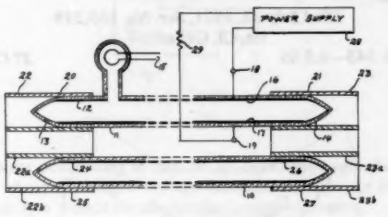
## WIDEBAND RADAR RECEIVER PROTECTIVE APPARATUS

William C. Quinn; Albert F. Morreall, and Alexander V. Ross, all of Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1972, Ser. No. 233,066

Int. Cl. G01s 9/00; H01p 1/14; H01j 17/16

U.S. Cl. 343—5 5 Claims




A wideband radar receiver protective apparatus is provided in which a glass envelope in the shape of an elongated doughnut is utilized to provide a low pressure glow discharge in a coaxial configuration. The coaxial configuration consists of two separated sections of coaxial transmission line with the glass envelope interposed therebetween. The coaxial configuration interconnects a transmitter and the receiver to be protected. Generation of the glow plasma is controlled by means of a power source separate from the transmitter. The length of the glow region determines the amount of attenuation. The glass envelope includes an inert gas in combination with a barium getter to preserve the purity of the gas almost indefinitely.

3,745,568

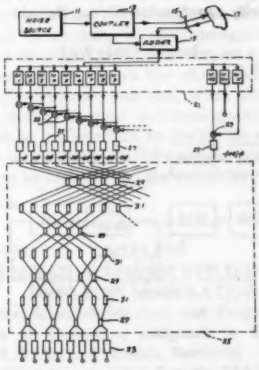
## SPECTRUM ANALYSIS RADAR

John K. Schindler, Chelmsford, and F. Sheppard Holt, Winchester, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1972, Ser. No. 242,996

Int. Cl. B01s 9/44

U.S. Cl. 343—5 SA 2 Claims



Noise source signals are added to their reflected signals and bandpass filtered in a comb filter having a sequence of frequency outputs which are pair-wise mixed and fed into a sequence of phase shifters with each phase shifter having a sequential linearly progressive phase shift. The outputs of the

phase shifters are fed to a matrix including alternate sequences of phase shifters with linearly progressive phase shifts and the phase shifters are interconnected in pairs with 90° hybrid junctions. Detectors are fed by the outputs of the matrix producing range gate outputs.

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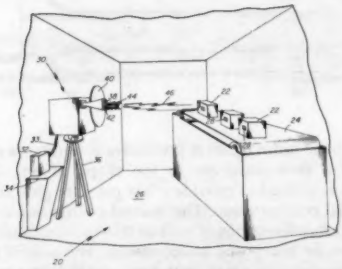
**3,745,569**

## REMOTELY POWERED TRANSPONDER

**George A. Works; John C. Murray, both of Hudson; Edward D. Ostroff, Sudbury, and Nathan Freedman, West Newton, all of Mass., assignors to Raytheon Company, Lexington, Mass.**

**Filed July 22, 1971, Ser. No. 165,219**
**Int. Cl. G01s 9/56**
**U.S. Cl. 343—6.5 SS** **27 Claims**



A transponder having a circuit for the extraction of power from an incident interrogating beam of electromagnetic energy, the extracted power being utilized to operate a digital coding circuit. The transponder further comprises an oscillator circuit for developing a train of pulses of electromagnetic energy with successive pulses occurring in a coded format in accordance with a digital code imparted by the digital coding circuit. The transponder is of sufficiently small size to be affixed in the form of a tag to automobiles, personnel, containers and other objects to be identified. The electronic tag communicates with an interrogation system.

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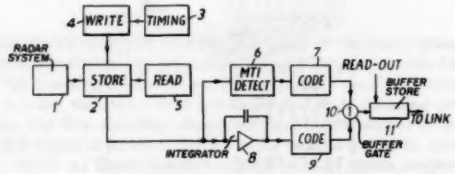
**3,745,570**

## IMPROVEMENTS RELATING TO MOVING TARGET INDICATING SYSTEMS

**Roger Voles, London, England, assignor to EMI Limited, Hays, Middlesex, England**

**Filed Apr. 1, 1970, Ser. No. 24,939**
**Claims priority, application Great Britain, Apr. 2, 1969, 17,251/69**
**Int. Cl. G01s 9/42**
**U.S. Cl. 343—7.7** **5 Claims**




An arrangement is described for processing the signals derived from a radar system in such a way as to reduce the bandwidth of the data representative of such signals, and so enable transmission of data derived from the system over a data link without sacrifice in the detection capabilities of the system with respect to moving targets.

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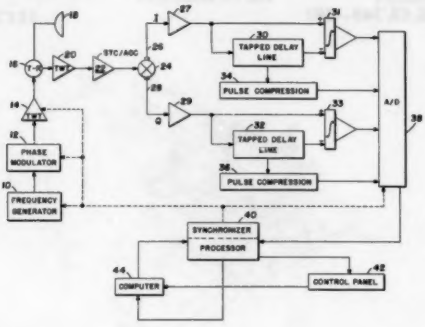
**3,745,571**

## COHERENT DIGITAL MULTIFUNCTION PROCESSOR

**Adolph M. Chwastyk, and Alan M. Diamant, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 18, 1972, Ser. No. 227,586**
**Int. Cl. G01s 9/42**
**U.S. Cl. 343—7.7** **12 Claims**




A coherent digital multifunction processor that is capable of multiple-mode processing and can also perform rapid intermode switching. Additionally, while processing data in a given mode, the subject processor is capable of self-synchronization, thereby obviating the requirement for external synchronous devices. The instant processor has a central control which may suitably utilize a general purpose computer in one embodiment. The primary modes of operation of the subject processor are: a pulse doppler acquisition and/or tracking mode, a moving target indicator mode, and an incoherence mode.

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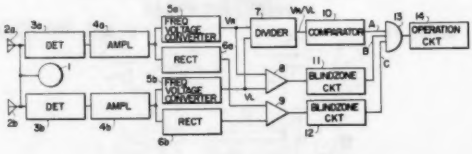
**3,745,572**

## METHOD OF PROTECTING PASSENGERS IN A MOVING VEHICLE UPON COLLISION THEREOF

**Kazuo Sato, and Tomio Hisatsune, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan**

**Filed Feb. 9, 1971, Ser. No. 113,897**
**Claims priority, application Japan, Feb. 19, 1970, 45/13817**
**Int. Cl. G01s 9/44**
**U.S. Cl. 343—7 ED** **18 Claims**




Advance indication of an impending vehicle collision is accomplished by detecting the Doppler Shift imposed on a wave signal radiated from a vehicle. A passenger protecting device is actuated when the danger of collision is detected. The ultrashort wave signal obtained in a generator is radiated from antennas arranged in a horizontally spread pattern so as to form a semi-circular object detecting region. The wave signal reflected from an oncoming object is received at two or more points on the vehicle. Each of these reflected waves received at two points is separately mixed with the radiated wave and is subjected to homodyne detection by means of detectors to obtain the Doppler signals. After the Doppler signals are amplified, the quantities of electricity proportional to respective frequency of Doppler signal are obtained by means of frequency-voltage converters. The value of the ratio of these

two quantities of electricity obtained by a divider is compared by a comparator. If this value is within a predetermined range, it indicates that two vehicles are in the crash region. The value of the sum of these two quantities obtained by an adder is compared in a blind zone circuit. When said value exceeds a certain value, it is determined that the relative velocity in the event of a crash is the critical velocity. Furthermore, the value of the sum obtained by an adder is compared in a blind zone circuit. When said value exceeds a certain value, the time allowance until a collision is determined. An actuating signal is issued from an "and" circuit only when said factors are all detected simultaneously, and an operation circuit actuates a passenger protecting device such air bag or the like.

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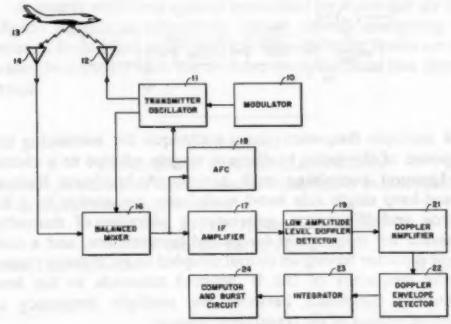
## 3,745,573
## PROXIMITY FUZE CIRCUIT

**John O. Dick, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Continuation-in-part of Ser. No. 56,612, Sept. 16, 1960, abandoned. This application Sept. 24, 1963, Ser. No. 311,260**

**Int. Cl. F42c** *13/04*; **G01s** *9/24*

**U.S. Cl. 343—7 PF** **4 Claims**




1. In a proximity fuze system the combination comprising,
a. transmitting circuit means including an oscillator for transmitting a frequency modulated wave of high frequency energy,
b. receiving circuit means including a balanced mixer for receiving said transmitted energy when reflected from a target,
c. said balanced mixer being coupled to said oscillator for producing an output which is the difference in frequency of said transmitted signal and said received signal,
d. amplifier means coupled to said mixer for amplifying said mixer output,
e. a biased diode low level detector means coupled to said amplifier for detecting the doppler signal from said mixer,
f. envelope detecting means coupled to the output of said low level detector means for masking background signals over a wide dynamic range present in said reflected energy,
g. and signal processing circuit means coupled to said envelope detecting means for utilizing said doppler signal.

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## 3,745,574
## RADAR TELEMETRING SYSTEM

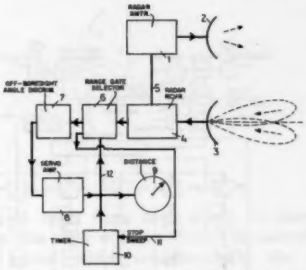
**Bertrand Daugny, Neuilly-sur-Seine, and Jean Schifrine, Vaucresson, both of France, assignors to Electronique Marcel Dassault, Paris, France**

**Filed June 8, 1971, Ser. No. 151,109**

**Int. Cl. G01s** *9/06*

**U.S. Cl. 343—7 A** **5 Claims**

A radar telemetering system for pinpointing targets employs means for defining, on the basis of incoming echo pulses, a line or plane of referance dividing the space into two off-boresight zones. The radar receiver supplies signal pulses to a range-gate selector in response to the arriving echoes, the




selector controlling in turn an off-boresight-angle discriminator whose d-c-output voltage readjusts the selector in a sense tending to reduce the discriminator output to zero.

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## 3,745,575
## METHOD OF DETECTING SUBSURFACE OBJECTS

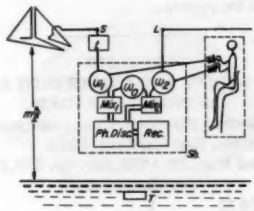
**Hideyuki Kikuchi, Musashino, Japan, assignor to Kikuchi Natural and Applied Science Research Laboratory, Minami-Saku-gun, Nagano-ken, Japan**

**Filed Feb. 1, 1972, Ser. No. 222,631**

**Claims priority, application Japan, Feb. 9, 1971, 46/5401**

**Int. Cl. G01s** *9/02*; **G01v** *3/12*

**U.S. Cl. 343—12 R** **7 Claims**




A method of detecting subsurface objects such as ore deposits by producing a graded transition layer for the propagation of electromagnetic waves having, for example, an exponential or square law characteristic at the air-water or air-earth interface by directing an electromagnetic wave from a stereo antenna through a non-linear element having, for example, an exponential or square law characteristic and a half-wavelength space transformer and, when desired, by simultaneously directing another electromagnetic wave from a linear antenna to the interface to enable the electromagnetic waves to pass through the interface to penetrate into the water or earth and to be reflected by the subsurface objects into the air.

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## 3,745,576
## IMPULSE RADAR SYSTEM UTILIZING PULSE DURATION MODULATION

**Friedrich Baur, Muenich-Maxhof, and Jurgen Naujoks, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

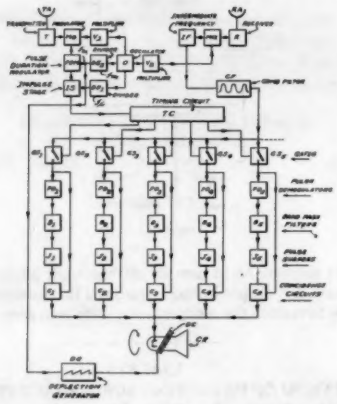
**Filed June 1, 1961, Ser. No. 114,266**

**Int. Cl. G01s** *9/06*

**U.S. Cl. 343—13 R** **5 Claims**

1. An impulse radar system operating with high pulse repetition frequency and doppler frequency evaluation and employing a plurality of distance measuring branches which are, for the measurement of the pulse frequency, by means of gate

switches successively scanned by sampling pulses, comprising means at the receiver side for pulse duration modulating the pulses transmitted, at the receiver side for demodulating pulse duration modulation applied periodically at the transmitting side so as to produce rough distance measuring pulses, a coincidence circuit, and means for conducting said rough distance measuring impulses together with other pulses to said coincidence circuit, operative to form fine pulses upon coincidence of the pulses conducted thereto, which permit unequivocal distance indication even in the presence of high pulse repetition frequency.



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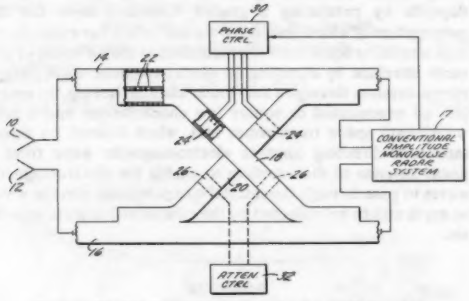
**3,745,577**

## VARIABLE SQUINT AND BEAMWIDTH AMPLITUDE MONOPULSE RADAR

**Irving I. Goldmacher, Stamford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed Mar. 29, 1972, Ser. No. 239,274**
**Int. Cl. G01s 9/22**
**U.S. Cl. 343—16 M** **6 Claims**




In an amplitude monopulse radar, a cross coupling network between the respective feeds of a dual-radiator, angle measuring antenna array, couples energy from each feed into the other, with variable phase and amplitude adjustments to the energy coupled from one feed to the other feed, thereby providing, in effect, an artificial alteration in the intercoupling between the elements of the antenna array, in a manner to control the squint angle (or angle off of boresight) and beamwidth of the array.

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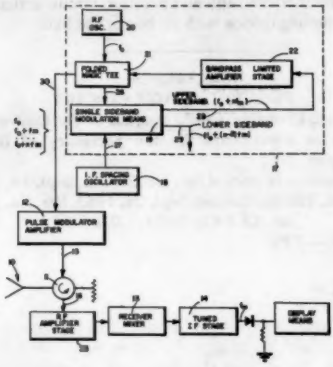
**3,745,578**

## MULTIPLE FREQUENCY RADAR SYSTEM HAVING IMPROVED RESPONSE TO SMALL TARGETS

**Carl R. Barrett, Jr.; James E. Feeney, both of Anaheim; Abe Goldstein, Santa Ana, and Raymond F. Racine, Orange, all of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.**

**Filed Aug. 2, 1965, Ser. No. 476,630**
**Int. Cl. G01s 9/02**
**U.S. Cl. 343—17.2 R** **17 Claims**




A multiple frequency radar technique for enhancing the response of the radar to discrete targets relative to a clutter background containing such targets. A bandpass limited, closed-loop single side band modulator, responsive to a RF source and IF source, generates a plurality of mutually-coherent RF frequencies for pulsed transmission, and a non-linear detector having an output coupled to an IF stage (tuned to the frequency of the IF source) responds to the beat frequency difference between the multiple frequency of received echoes of the transmitted energy.

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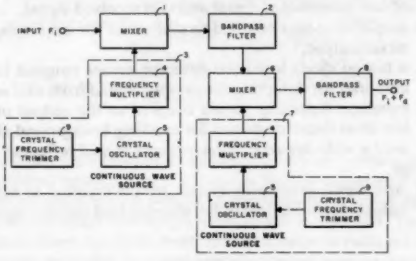
**3,745,579**

## DOUBLE MIXING DOPPLER SIMULATOR

**Lauren R. Lott, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 26, 1969, Ser. No. 803,527**
**Int. Cl. G01s 7/40**
**U.S. Cl. 343—17.7** **4 Claims**



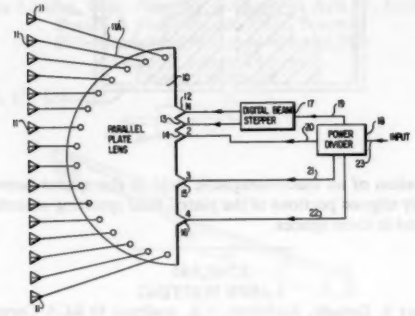

A double mixing doppler simulator comprising a first balanced mixer, a first continuous wave source connected to the first balanced mixer, a first bandpass filter, also connected to the first balanced mixer, and a second balanced mixer connected to the first band-pass filter. The doppler simulator further comprises a second continuous wave source and a second band-pass filter connected to the second balanced mixer.

3,745,580

## DIGITAL BEAM DISPLACEMENT CIRCUIT

Fred E. Burnham, Silver Spring, Md., assignor to Litton Systems, Inc., College Park, Md.

Filed Apr. 26, 1971, Ser. No. 137,133
Int. Cl. H01q 3/24
U.S. Cl. 343—100 SA 10 Claims



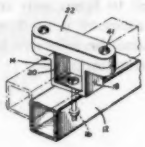

A matrix switching system controlled by a code of six fixed digital signals to selectively switch signals energizing two spaced feeds of an antenna array. Five different codes are provided to digitally shift the antenna array beam in five discrete steps.

3,745,581

## DUAL BAND FOLDING ANTENNA

Lynn L. Lockwood, Burlington, Iowa, assignor to Antennacraft Company, Burlington, Iowa

Filed Feb. 23, 1972, Ser. No. 228,499
Int. Cl. H01q 21/12
U.S. Cl. 343—730 11 Claims



A dual band folding antenna is provided which includes first and second elongated booms disposed in adjacent, parallel relationship and means coupling the booms together for relative sliding movement. A first antenna element adapted to receive a first band of radio frequency signals is pivotably coupled to the first boom and a second antenna element, adapted to receive a second band of radio frequency signals, has one end thereof pivotably coupled to the first element between the ends thereof and has its opposite end pivotably coupled to the second boom.

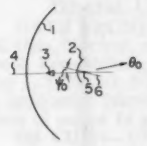
3,745,582

## DUAL REFLECTOR ANTENNA CAPABLE OF STEERING RADIATED BEAMS

Masahiro Karikomi, and Yoshio Kataoka, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Sept. 15, 1971, Ser. No. 180,639
Claims priority, application Japan, Sept. 28, 1970, 45/84107
Int. Cl. H01q 3/00
U.S. Cl. 343—758 6 Claims

In a dual reflector antenna comprising a main reflector and a subreflector, the reflector curves of the main reflector and the subreflector are so constructed that when the subreflector is inclined at two angles relative to the main reflector, the radiated beams are in phase in two different directions slightly angularly spaced apart from each other. In steering the radiated beams, the angle of inclination of the subreflector is continuously varied while simultaneously the distance between the main reflector and the subreflector is varied.

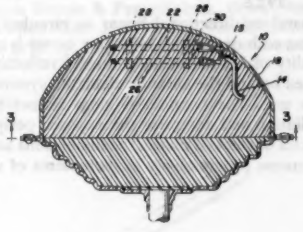


3,745,583

## OMNI-DIRECTIONAL TRANSMITTING & RECEIVING ANTENNA

Lawrence W. Herbert, Lindenhurst, Ill., assignor to Vorta Systems, Inc., Round Lake, Ill.

Filed Nov. 26, 1971, Ser. No. 202,340
Int. Cl. H01q 11/12
U.S. Cl. 343—742 2 Claims



There is disclosed an omni-directional transmitting and receiving antenna which, in the preferred embodiment, is particularly suitable for use on the ship to shore marine frequencies. The antenna comprises a non-conductive hollow outer shell; a first substantially circularly shaped conductive element located within the outer shell and wherein the first conductive element contains a discontinuity; a second circularly shaped continuous conductive element located within the outer shell adjacent to and coaxially with the first conductive element; and a first means for electrically connecting the first conductive element to the second conductive element.

3,745,584

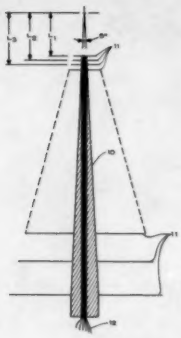
## LOG PERIODIC RADIAL ARM-COUPLED LOOP ANTENNA

Robert G. Corzine, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 9, 1971, Ser. No. 151,480
Int. Cl. H01q 11/10
U.S. Cl. 343—792.5 2 Claims

A radial arm-coupled loop log-periodic antenna comprising

a tapered mounting member with circular elements positioned thereon, one side of the elements having radials thereon for providing a sum mode, the other side of the elements having loops thereon for providing a difference mode pattern.



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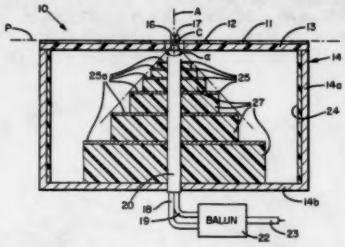
**3,745,585**

## BROADBAND PLANE ANTENNA WITH LOG-PERIODIC REFLECTORS

**Normand Barbano, Sunnyvale, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.**

**Filed Mar. 29, 1972, Ser. No. 239,128**
**Int. Cl. H01q 1/36**
**U.S. Cl. 343—792.5** **13 Claims**

A broadband unidirectional linear or circularly polarized plane antenna with or without reflecting cavity is constructed with a plurality of log-periodically related reflecting rings or bands stacked behind the antenna elements symmetrically of the antenna axis. The conductive rings reflect backwardly directed radiation and comprise the exposed peripheral portions of a series of stacked plates, the dimensions and spacings of which increase progressively in increments of a predetermined ratio from a minimum adjacent the antenna elements to a maximum remote from the elements. In order to prevent the formation of an electromagnetic field in the spaces between axially aligned portions of the plates, field arresting material is located in these spaces.

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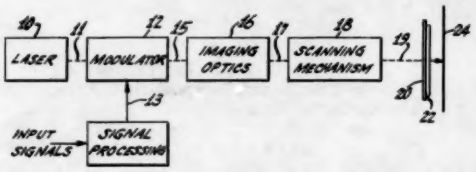
**3,745,586**

## LASER WRITING

**Robert S. Braudy, Audubon, N.J., assignor to RCA Corporation, New York, N.Y.**

**Continuation of Ser. No. 779,865, Nov. 29, 1968, abandoned.**
**This application July 1, 1971, Ser. No. 158,989**
**Int. Cl. G01d 15/10**
**U.S. Cl. 346—76** **4 Claims**




Laser energy is used to selectively irradiate the uncoated surface of a thin film element, coated on one surface with an ink-like coating, to cause the selective transfer of the coating to an adjacently spaced material.

# DESIGNS

## JULY 10, 1973

**227,620**
**BRUSH**
**Per Lindbo, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway**
**Filed June 24, 1971, Ser. No. 156,598**
**Term of patent 14 years**
**Int. Cl. D4—*02***
**U.S. Cl. D4—31**

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**227,621**
**BRUSH**
**Per Lindbo, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway**
**Filed June 24, 1971, Ser. No. 156,600**
**Term of patent 14 years**
**Int. Cl. D4—*02***
**U.S. Cl. D4—31**

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**227,622**
**BRUSH**
**Per Lindbo, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway**
**Filed June 24, 1971, Ser. No. 156,601**
**Term of patent 14 years**
**Int. Cl. D4—*02***
**U.S. Cl. D4—31**

**227,623**
**BATH BRUSH**
**Baard Spydevold, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway**
**Filed May 1, 1972, Ser. No. 249,474**
**Claims priority, application Norway Mar. 27, 1972**
**Term of patent 14 years**
**Int. Cl. D4—*02***
**U.S. Cl. D4—32**

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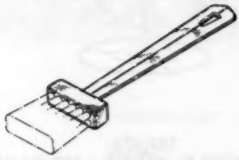
**227,624**
**BRUSH HANDLE**
**Baard Spydyevold, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway**
**Filed Mar. 3, 1972, Ser. No. 231,793**
**Claims priority, application Norway Nov. 8, 1971**
**Term of patent 14 years**
**Int. Cl. D4—*04***
**U.S. Cl. D4—38**



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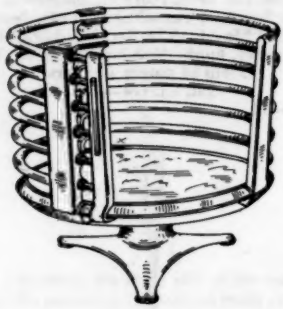
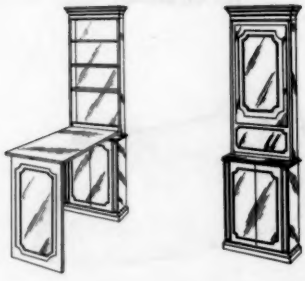
**227,625**
**CHILD'S SEAT**
**George A. Le Hew, 1341 Oakwood Drive, Anoka, Minn. 55303**
**Filed Nov. 5, 1971, Ser. No. 196,255**
**Term of patent 3½ years**
**Int. Cl. D6—*01***
**U.S. Cl. D6—7**

227,626
BABY'S CRIB OR THE LIKE
Scott M. Ferguson, 8870 Root St., Apt. 1, Niles, Ill. 60648
Filed Sept. 15, 1971, Ser. No. 180,943
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—16

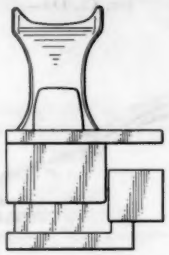


227,627
CAKE STAND
Betty G. Stephenson, 125 Sue Lane, Independence, Mo. 64050
Filed Aug. 9, 1971, Ser. No. 170,419
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20

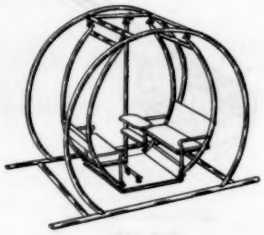
227,628
COMBINED CABINET AND TABLE
Kenneth Charles Howerd Villiers, 140 Sloane St., London, SW 1, England
Filed Nov. 8, 1971, Ser. No. 196,874
Claims priority, application Great Britain June 14, 1971
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—40



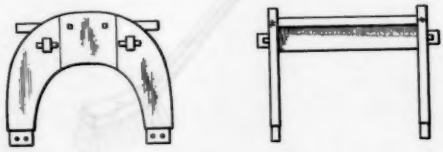
227,629
COMBINED CHAIR, DESK AND SIDEBOARD CABINET OR SIMILAR ARTICLE
Odo Klose, Wuppertal-Elberfeld, Germany, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Oct. 1, 1971, Ser. No. 185,920
Claims priority, application Switzerland May 7, 1971
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—42



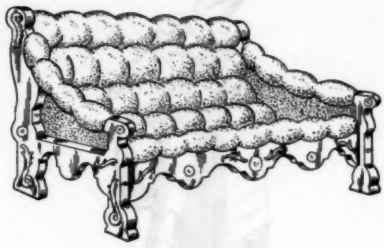
227,630
LAWN SWING
Romeo Oliva Gaucher, Bonneyville, Alberta, Canada
Filed July 11, 1972, Ser. No. 270,607
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—52



227,631
RESTAURANT DINING CHAIR
James T. Sakata, 653 20th Ave., San Francisco, Calif. 94121
Filed July 2, 1971, Ser. No. 159,164
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—58



227,632
UPHOLSTERED SEAT
Evalin S. Gilbert, 2121 N. Bay Shore Drive, Miami, Fla. 33137
Filed June 6, 1972, Ser. No. 260,350
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—62

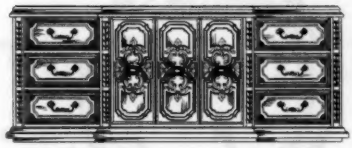


227,633
CHAIR
Irving Harmon Kellman, Springvale, Maine, assignor to Spaulding Fibre Company, Inc., Dover, N.H.
Filed Apr. 6, 1971, Ser. No. 131,845
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—66

227,634
CHAIR
Fuller Robinson, La Valle, Quebec, Canada, assignor to Standard Desk Company
Filed Oct. 29, 1970, Ser. No. 25,711
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—69

227,635
LIQUID DISPENSER
Harvey L. Friedman, 6361 Fairhaven Road, Mayfield Heights, Ohio 44124
Continuation-in-part of abandoned design application Ser. No. 169,160, Aug. 4, 1971. This application Nov. 10, 1971, Ser. No. 197,592
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—95

227,636
DRESSER WITH BAMBOO POSTS
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,825
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

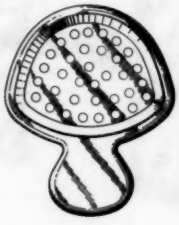


227,637
BASE FOR ORGAN BENCH
Roy W. Rust, Independence, Ky., and Leslie J. Weigel, Hubert S. Shearin, and Emerson Henthorn, Cincinnati, Ohio, assignors to Manual Arts Furniture Company, Cincinnati, Ohio
Filed Sept. 13, 1971, Ser. No. 180,248
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—196

227,638
PORTABLE DESK
Joel S. Graves, Fenton, Mich., assignor to American Standard Inc., New York, N.Y.
Filed Nov. 18, 1971, Ser. No. 200,276
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—173

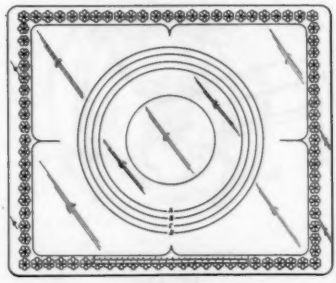
227,639
MOLDED PLASTIC PLATE
Clara Virginia Eicholtz, Midland, and Bertrand N. Trombley, Birmingham, Mich., assignors to Nyman Mfg. Co., Providence, R.I.
Filed Dec. 27, 1971, Ser. No. 212,843
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—36

227,640
COASTER
Robert J. Biondi, 839 Park Ave., Kennett Square, Pa. 19348
Filed Oct. 7, 1971, Ser. No. 187,600
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—45



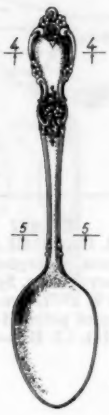
227,641
CREAMER
John W. Downey, Warren, Pa., assignor to Whirley Industries, Inc., Warren, Pa.
Filed May 13, 1971, Ser. No. 143,296
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—60

PASTRY SHEET OR THE LIKE
227,642
Robert Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Continuation-in-part of design application Ser. No. 22,995, May 15, 1970. This application May 4, 1971, Ser. No. 140,317
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—85



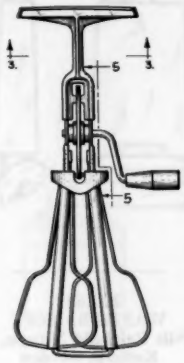
227,643
COOKING APPARATUS FOR BAKING, GRILLING AND THE LIKE
Walter Koziol, Russell, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed May 12, 1971, Ser. No. 142,842
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

227,644
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 24, 1972, Ser. No. 256,632
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

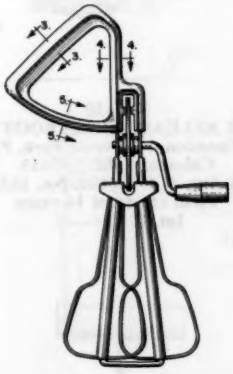


227,645
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 30, 1972, Ser. No. 258,217
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

227,646
CULINARY MIXER
Roger L. Kelly, Palatine, Ill., assignor to American Home Products Corporation, New York, N.Y.
Filed Jan. 22, 1971, Ser. No. 109,085
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153

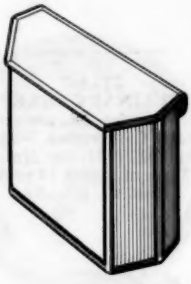


227,647
CULINARY MIXER
Roger L. Kelly, Palatine, Ill., assignor to American Home Products Corporation, New York, N.Y.
Filed Jan. 22, 1971, Ser. No. 109,087
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153

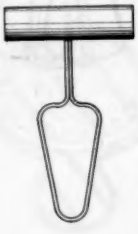


227,648
HOUSING FOR A RUG SHAMPOOER
Robert A. Yonkers, Grandville, Mich., assignor to Bissell Inc., Grand Rapids, Mich.
Filed June 9, 1971, Ser. No. 151,629
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—170

227,649
WASTE BASKET
Stig Gustav Nils Reinhold Nilsson, P.O. Box 25, Kattarp, Sweden
Filed Jan. 14, 1971, Ser. No. 106,637
Term of patent 7 years
Int. Cl. D7—*05*
U.S. Cl. D7—193



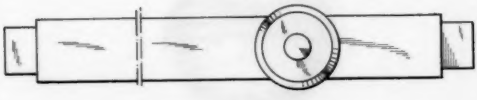
227,650
HOOK FOR RELEASING SKI BOOT BUCKLES
Robert W. Sneddon, Ponderosa Park, P.O. Box 49, Coloma, Calif. 95613
Filed Aug. 6, 1971, Ser. No. 169,888
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



227,651
SINK TRAP WRENCH
Lee E. Sharff, 3327 Military Drive, Falls Church, Va. 22044
Filed May 4, 1971, Ser. No. 140,312
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—17

227,652
AIR DRILL OR SIMILAR ARTICLE
Harley E. Linthicum, Springfield, Ohio, assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 9, 1971, Ser. No. 151,634
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—68

227,653
DOUBLE BAR LOCK
Richard D. Babcock, Massapequa, N.Y., Melvin A. Gervis, Haworth, and Eugene Taras Wozny, Harrington Park, N.J., and Nicholas Giardina, Mount Vernon, N.Y., assignors to Magic Eye Associates, Inc., New York, N.Y.
Original design application May 21, 1971, Ser. No. 146,000. Divided and this application Apr. 19, 1972, Ser. No. 245,709
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—117



**JUG OR SIMILAR ARTICLE**

**227,654**

David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 5, 1971, Ser. No. 196,249
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39

**227,655**

**BOTTLE**

Gordon A. Strand, Toledo, Ohio, and Richard L. Drow, Milwaukee, Wis.; said Strand assignor to Owens-Illinois, Inc., Toledo, Ohio, said Drow assignor to Graf's Beverages, Inc., Milwaukee, Wis.

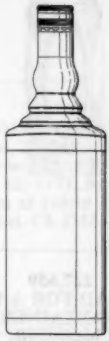
Filed Apr. 10, 1972, Ser. No. 242,907
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—102

**227,656**

**COMBINED BOTTLE AND CAP**

Reginald Malcolm Broadhead, Maidenhead, England, assignor to Crown Distillers Limited, London, England

Filed Dec. 27, 1971, Ser. No. 212,874
Claims priority, application Great Britain Nov. 12, 1971
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—159



**227,657**

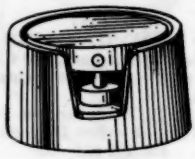
**CAN OR SIMILAR ARTICLE**

Richard B. Bagguley, Orland Park, and Carmen T. Mascia, Westmont, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

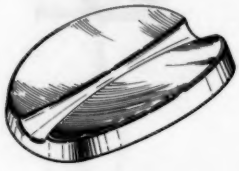
Filed Apr. 12, 1972, Ser. No. 243,527
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

227,658
CAN OR SIMILAR ARTICLE
Richard B. Bagguley, Orland Park, and Carmen T. Mascia, Westmont, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 12, 1972, Ser. No. 243,528
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

227,659
DISPENSER HEAD FOR A PRESSURIZED CONTAINER
Richard E. Johnson, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.
Filed June 14, 1972, Ser. No. 262,700
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258

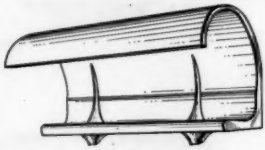


227,660
SHOPPING BAG HANDLE HOLDER
Kane Y. Konno, 32—76 32d St., Astoria, N.Y. 11106
Filed Mar. 27, 1972, Ser. No. 238,717
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—292

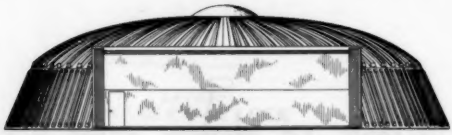


227,661
PLATFORM TRAILER
Wylie A. Mason, Jr., 373 Dawson Drive, Camarillo, Calif. 93010
Filed Mar. 26, 1969, Ser. No. 19,816
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3 E

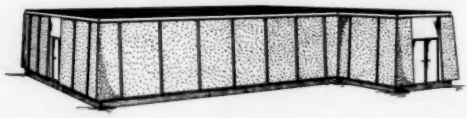
227,662
SHELTER
Bertram S. Warshaw, Miami, and R. William Clayton, Fort Lauderdale, Fla., assignors to Transportation Terminals of America, Inc., Miami, Fla.
Filed Nov. 30, 1971, Ser. No. 203,502
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 D



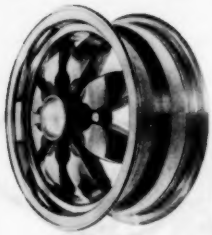
227,663
DOMED BUILDING
James F. Garufo, Max W. Snodgrass, Guy M. Shelley, Jr., and George C. Christopher II, Wichita, Kans., assignors to Aerodome Industries, Inc., Wichita, Kans.
Filed Dec. 17, 1971, Ser. No. 209,483
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 E



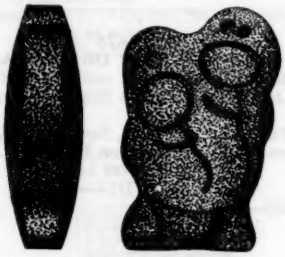
227,664
BUILDING
Donald Michael Genaro, Haworth, N.J., and Gordon Elliott Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 29, 1971, Ser. No. 213,793
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



227,665
WHEEL
Thomas B. Griffith, San Carlos, Calif., assignor to American Racing Equipment, Brisbane, Calif.
Filed Aug. 25, 1971, Ser. No. 175,037
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—30 R



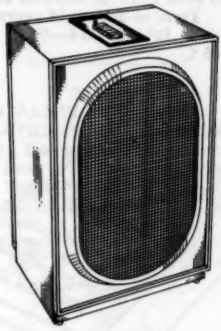
227,666
VITAMIN TABLET OR SIMILAR ARTICLE
Ian C. Modelevsky, Pleasantville, Benjamin S. De Young, Sands Point, and Donald Nevins, East Elmhurst, N.N.Y., and Anthony Stern, Mexico City, Mexico, assignors to Bristol-Myers Company, New York, N.Y.
Filed June 27, 1972, Ser. No. 266,761
Term of patent 14 years
Int. Cl. D1—*01;* D28—*01*
U.S. Cl. D16—3



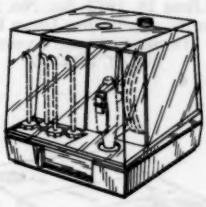
227,667
FISH LURE
Jimmie D. Thomas, 5126 Plainview Road, San Diego, Calif. 92110
Filed May 8, 1972, Ser. No. 251,582
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

227,668
ARTIFICIAL FISHING WORM
Bill K. Norman, P.O. Box 6383, South Station, Fort Smith, Ark. 72901
Filed May 15, 1972, Ser. No. 253,691
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

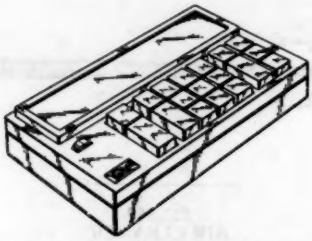
227,669
AIR CLEANER
Samuel J. Mann, Englewood, N.J., assignor to Westinghouse Electric Corporation
Filed Sept. 15, 1971, Ser. No. 180,931
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—149



227,670
ORAL HYGIENE APPLIANCE AND COVER
Richard S. Hart, Batavia, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed June 21, 1972, Ser. No. 264,761
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 B



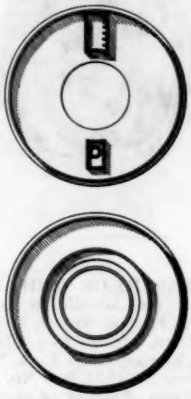
227,671
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co.
Filed Apr. 10, 1972, Ser. No. 242,897
Claims priority, application Japan Nov. 11, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



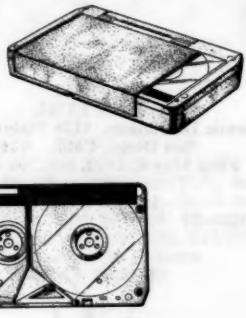
227,672
COMBINATION CLOCK AND CALCULATOR
Moto Shimano, Los Angeles, and Lloyd Y. Ishimaru, Agoura, Calif., assignors to Garrett Comtronics Corporation, San Diego, Calif.
Filed June 1, 1972, Ser. No. 258,923
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

227,673
CALCULATING MACHINE
Hisashi Maeda, 24 Imazato Yakushido, Nagaokacho, Otokuni-gun, Kyoto-fu, Kyoto, Japan, and Hironori Yoshikawa, 7–40 Higashikouri Shinmachi, Hirakata-shi, Osaka-fu, Osaka, Japan
Filed June 20, 1972, Ser. No. 264,573
Claims priority, application Japan Dec. 22, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

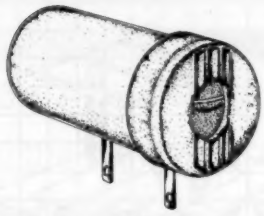
227,674
REEL FOR MAGNETIC TAPE
Horace T. Montgomery, Mission Viejo, and Hormoz Rafaat, Corona Del Mar. Calif., assignors to Memorex Corporation, Santa Clara, Calif.
Filed Sept. 1, 1971, Ser. No. 177,194
Term of patent 14 years
Int. Cl. D14—*01;* D16—*05*
U.S. Cl. D26—14 B



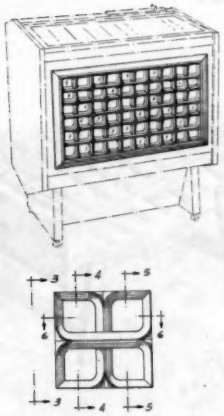
227,675
VIDEO TAPE MAGAZINE OR SIMILAR ARTICLE
Takao Takanashi, Kawasaki, and Masaharu Kobayashi, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Sept. 27, 1971, Ser. No. 184,326
Claims priority, application Japan Aug. 9, 1971
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



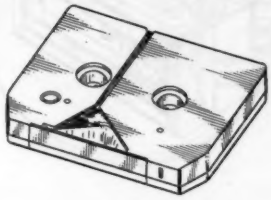
227,676
**ANTENNA FOR RADIO RECEIVER**
Takeshi Okada, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 23, 1971, Ser. No. 211,829
Claims priority, application Japan June 25, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14 F



227,677
**PHONOGRAPH FRONT PANEL**
Walter L. Koch, Caldwell, and Robert P. Franklin, Jefferson Township, N.J., assignor to Rowe International Inc., Whippany, N.J.
Filed Mar. 5, 1971, Ser. No. 121,622
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14 G

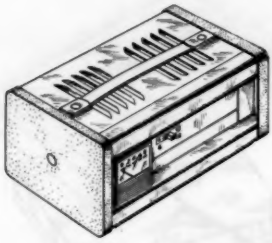



227,678
**VIDEO TAPE MAGAZINE OR SIMILAR ARTICLE**
Takao Takanashi, Kawasaki, and Masaharu Kobayashi, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 25, 1972, Ser. No. 257,073
Claims priority, application Canada Apr. 26, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



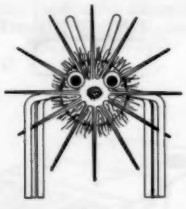
227,679
**CONTROL PANEL FOR A DATA ACCESS ACOUSTICAL COUPLER**
John P. Kennedy, Columbus, Ohio, assignor to MI², Inc.
Filed June 7, 1972, Ser. No. 260,713
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

227,680
**BATTERY CHARGER**
Albert J. Fischer, 4517 Wrightwood Ave., Chicago, Ill. 60639
Filed July 25, 1972, Ser. No. 275,070
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15 B

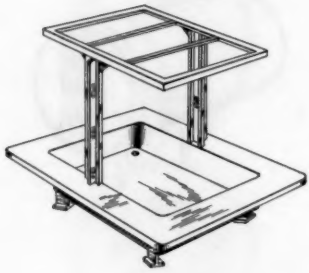


227,681
**BADGE**
Yasuji Itoh, Tokyo, Japan, assignor to Kabushiki Kaisha Kyobundoh, Tokyo, Japan
Filed July 17, 1972, Ser. No. 272,568
Claims priority, application Japan Jan. 18, 1972
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D29—2 R

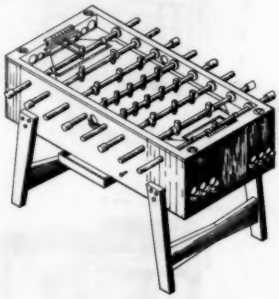
227,682
**TOY ANIMAL FIGURE**
Dixie D. David, Star Rte. 2, Box 466, Dexter, Oreg. 97431
Filed Oct. 18, 1971, Ser. No. 190,439
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



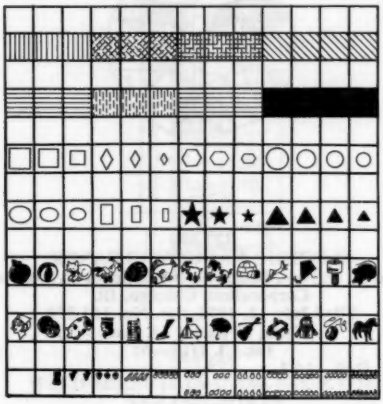
227,683
**COMBINATION SANDBOX AND POOL**
Walter Mitchko, 337 Elwood Road, East Northport, N.Y. 11731
Filed Nov. 22, 1971, Ser. No. 201,260
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 F



227,684
**GAME TABLE**
Lawrence T. Patterson, Cincinnati, Ohio, assignor to Patterson International Corporation, Cincinnati, Ohio
Continuation-in-part of design application Ser. No. 21,724, Mar. 3, 1970. This application Oct. 6, 1971, Ser. No. 187,235
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J



227,685
EDUCATIONAL GAME BOARD
Kenneth A. H. Gordon, Bedford, and Charles L. Chesnut, Chappaqua, N.Y., assignors to The Reader's Digest Association, Inc., New Castle, N.Y.
Filed July 3, 1972, Ser. No. 268,779
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

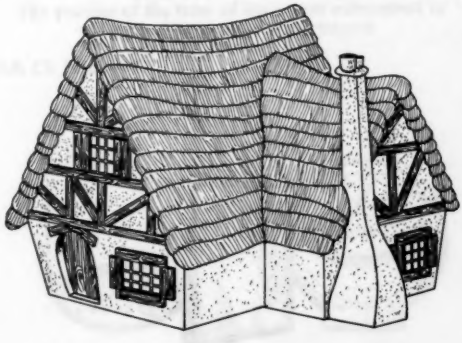


227,686
EDUCATIONAL GAME BOARD
Kenneth A. H. Gordon, Bedford, and Charles L. Chesnut, Chappaqua, N.Y., assignors to The Reader's Digest Association, Inc., New Castle, N.Y.
Filed July 3, 1972, Ser. No. 268,780
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

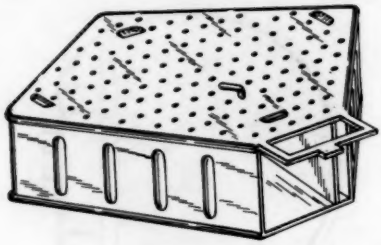
227,687
SNOW VEHICLE
Donald Huffman, Montreal, Quebec, Canada, assignor to Coleco Industries, Inc., Hartford, Conn.
Filed Apr. 5, 1972, Ser. No. 241,497
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AK

227,688
SKI
Raymond L. Chase, 16951 Round Lake Blvd., Anoka, Minn. 55303
Filed May 11, 1972, Ser. No. 252,539
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

227,689
TOYHOUSE
Donald A. Rae, Jenkintown, Pa., and Ronald Lax, Menlo Park, Calif., assignors to Donald A. Rae, Jenkintown, Pa.
Filed May 30, 1972, Ser. No. 258,193
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



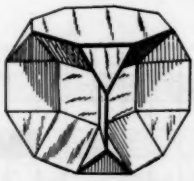
227,690
GRASS CATCHER
Joe Leader, 9115 W. 34th St., Minneapolis, Minn. 55426
Filed Mar. 27, 1972, Ser. No. 238,753
Term of patent 14 years
Int. Cl. D15—*03, 99*
U.S. Cl. D40—1 A



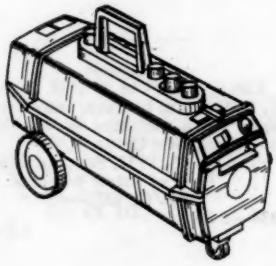
227,691
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron Inc., Providence, R.I.
Filed July 3, 1972, Ser. No. 268,673
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

227,692
FLUORESCENT EMERGENCY LIGHT
Richard Hughes and Thomas M. Steinbach, Park Ridge, Ill., assignors to Teledyne Big Beam Division, Teledyne Mid-America Corporation, Crystal Lake, Ill.
Filed Aug. 30, 1971, Ser. No. 176,430
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E

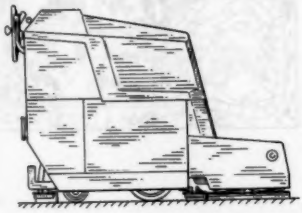
227,693
LAMP
Zvi Hecker, 122 Arlington Ave., Montreal 217, Quebec, Canada
Filed Sept. 9, 1971, Ser. No. 179,272
Claims priority, application Israel Mar. 21, 1971
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



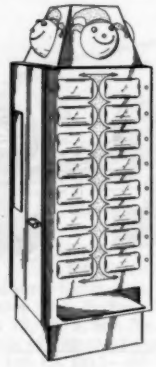
227,694
ELECTRIC VACUUM CLEANER
Julian R. Haynes, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 12, 1971, Ser. No. 161,370
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—14.3



227,695
SURFACE MAINTENANCE MACHINE
Lloyd D. Fortman and Joseph G. Kasper, Golden Valley, and John N. Polivka, Hopkins, Minn., assignors to Tennant Company, Minneapolis, Minn.
Filed Aug. 3, 1971, Ser. No. 168,791
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—9.1

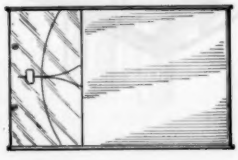


227,696
VENDING MACHINE
Darla R. Mandell, Houston, Tex., assignor to Marrick Industries, Inc., Houston, Tex.
Filed Mar. 20, 1972, Ser. No. 236,551
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R

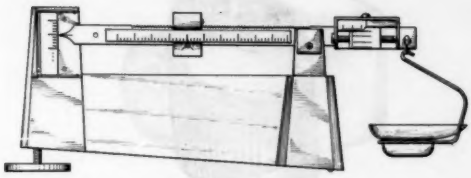


227,697
WIND DIRECTION INDICATOR FOR SAILING BOATS
Harald Unden, Stockholm, Sweden, assignor to AB Radab, Stockholm, Sweden
Filed May 10, 1972, Ser. No. 252,148
Claims priority, application Sweden Mar. 3, 1972
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D52—6 D

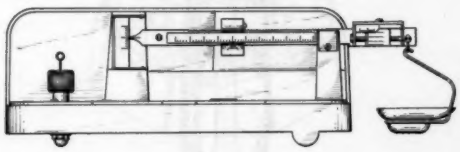
227,698
UNIVERSAL OVER/UNDER INDICATING HEAD FOR A SCALE
Edward Alan Koyen, Parsippany, N.J., and Samuel S. Leotta, Jenkintown, Pa., assignors to Ohaus Scale Corporation, Florham Park, N.J.
Filed Aug. 25, 1971, Ser. No. 175,021
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10 A



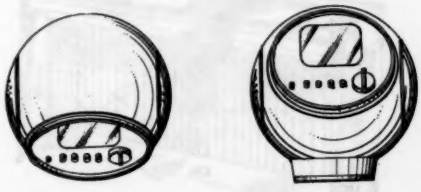
227,699
WEIGHING SCALE
Samuel S. Leotta, Jenkintown, Pa., and Earl D. Myers, Scotch Plains, N.J., assignors to Ohaus Scale Corporation
Filed Apr. 11, 1972, Ser. No. 243,104
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10 R



227,700
WEIGHING SCALE
Samuel S. Leotta, Jenkintown, Pa., and Earl D. Myers, Scotch Plains, N.J., assignors to Ohaus Scale Corporation
Filed Apr. 11, 1972, Ser. No. 243,106
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10 R



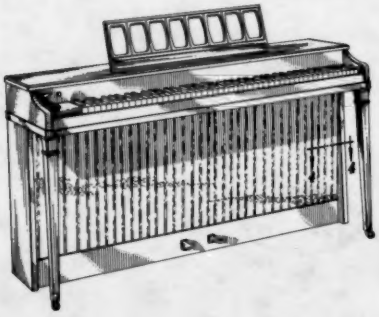
227,701
TELEVISION SET
Ryuzo Fujita, Suidobashi Bldg., 4–4, 1-chome, Hongo, Bunkyo-ku, Tokyo, Japan
Filed July 6, 1971, Ser. No. 160,232
Term of patent 14 years
The portion of the term of the patent subsequent to July 11, 1986, has been disclaimed
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



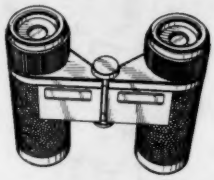
227,702
TRANSISTOR RADIO RECEIVER
Vong Hoi Tong, Man Wah Bldg. (14th floor) 18 Man Wui St., Kowloon, Hong Kong
Filed May 17, 1972, Ser. No. 254,339
Claims priority, application Great Britain Nov. 24, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

227,703
TRANSISTOR RADIO RECEIVER
Vong Hoi Tong, Man Wah Bldg. (14th floor), 18 Man Wui St., Kowloon, Hong Kong
Filed Aug. 11, 1972, Ser. No. 279,952
Claims priority, application Great Britain Feb. 15, 1972
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

227,704
ELECTROPIANO
Winsor D. White, Jr., Blowing Rock, N.C., assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Apr. 21, 1971, Ser. No. 136,295
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9

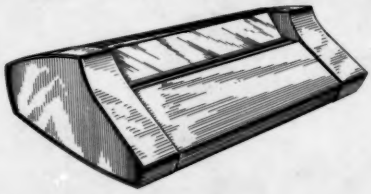


227,705
BINOCULAR
Shigeo Mizukawa, Ohmiya, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Ohmiya-shi, Saitama-ken, Japan
Filed Aug. 19, 1971, Ser. No. 173,341
Claims priority, application Japan Mar. 6, 1971
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E

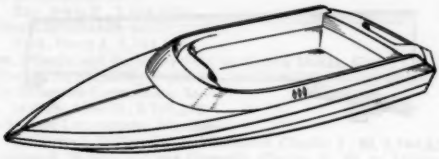


227,706
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Aug. 11, 1972, Ser. No. 282,186
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

227,707
LINE PRINTER
Norman Allen Cargill, Warminster, Pa., assignor to Peripheral Dynamics, Inc., Morristown, Pa.
Filed Mar. 16, 1972, Ser. No. 235,471
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



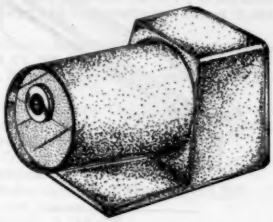
227,708
**BOAT**
Kenneth R. Baker, Sunnyvale, and Ronald Plecia, San Jose, Calif., assignors to Sidewinder Marine, Inc., Palo Alto, Calif.
Filed Oct. 12, 1970, Ser. No. 25,437
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



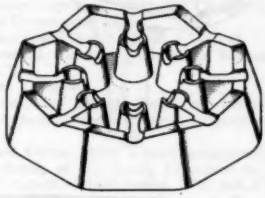
227,709
**WATER PICKUP FOR MARINE CRAFT**
Walter James Chadburn, Santa Ana, Calif., assignor to Aquasea, Inc., Irvine, Calif.
Filed July 13, 1971, Ser. No. 162,328
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D71—1 S

227,710
**CANDLE**
William W. Riffle, 5416 Aberdeen, Fairway, Kans. 66205, and Paul S. Kivett, 1507 Mews Drive, Kansas City, Mo. 64131
Filed June 16, 1971, Ser. No. 150,255
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1

227,711
**ELECTRIC PENCIL SHARPENER**
Daisuke Kajiwara, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 17, 1971, Ser. No. 209,498
Claims priority, application Japan June 18, 1971
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—21 B

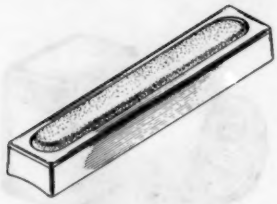


227,712
**ASH TRAY**
Alvin W. Hunt, 1209–B Bay St., Santa Monica, Calif. 90405
Filed Oct. 12, 1971, Ser. No. 188,656
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2 H



227,713
**TOBACCO PIPE OR SIMILAR ARTICLE**
William Geiser, 903 Alta St., Monrovia, Calif. 91016
Filed Apr. 26, 1971, Ser. No. 137,745
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8 A

227,714
NAIL BUFFER
Shogo Ishii, Tokyo, Japan, assignor to Syntak Company Ltd.
Filed Nov. 1, 1971, Ser. No. 194,778
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 C



227,715
HAIR DRYER
Kanemitsu Yamaoka, 152 Hisakata, 1-chome, Showa-ku, Nagoya, Japan
Filed Dec. 29, 1971, Ser. No. 213,782
Claims priority, application Japan Oct. 29, 1971
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

227,716
HAIR GROOMING IMPLEMENT HOLDER
Martin J. Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Jan. 31, 1972, Ser. No. 222,446
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

227,717
TRAY FOR CURLERS
James F. Severino, 3117 SW. 6th, Des Moines, Iowa 50315
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# LIST OF PATENTEES

## TO WHOM

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Belzer, Hans-Joachim; and Kubitzki, Gerhard, to Licentia Patent-Verwaltungs-G.m.b.H. Method and apparatus for determining the thermal internal resistance in semiconductors of the same type. 3,745,460, Cl. 324-158.00t.
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Bertrand, Marcel Jean; and Moitzheim, Henrich, to Uniroyal A.G. Tire building drum for positioning a bead ring. 3,745,085, Cl. 156-400.000.

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Bethe, Klaus, to U.S. Philips Corporation. Thermistor and method of manufacturing same. 3,745,506, Cl. 338-22.000.

Beusch, Christian. Machine for continuously making ice. 3,744,266, Cl. 62-189.000.

Bey, Paul B.; and Patten, Raymond A., to United States of America, Navy. Optical film thickness monitor. 3,744,916, Cl. 356-161.000.

Beyers, Marvin E.; Bockhaus, James A.; and Stedman, Robert N., to Caterpillar Tractor Company. Motor grader with power actuated side casting means. 3,744,568, Cl. 172-33.000.

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Blank, Hans G.; and Margolies, Arthur, to GTE Laboratories Incorporated. Time interval interpolator. 3,745,364, Cl. 328-41.000.

Blasnik, William. Rotary mixer. 3,744,767, Cl. 259-117.000.

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Bond, David A., to Agbabian-Jacobson Associates. Locking device for an adjustable support system. 3,745,302, Cl. 219-213.000.

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Bonnard, Lucien; Pich, Rene; and Palsky, Alain, to Societe Rhodiaceta. Sulphonated polyethers. 3,745,141, Cl. 260-40.00r.

Bonnet, Alain: *See—*
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Bonteil, Robert C., to Societe d'Etude et d'Exploitation de Procedes pour l'Industrie Alimentaire SEPIAL. Process and apparatus for removing the outer layer from cereal grains by a wet method. 3,744,399, Cl. 99-233.600.

Booher, Keith E.; and Van Loozen, George M., to Syntex Corporation. Implanter having an improved cartridge ejector. 3,744,493, Cl. 128-217.000.

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Bose, Robert N. Method for cooling thermoformed plastic parts. 3,744,262, Cl. 62-62.000.

Bossler, Robert B., Jr., to Kaman Aerospace Corporation. Sectional boat construction. 3,744,071, Cl. 9-2.00s.

Bottorff, Edmond M., to Lilly, Eli, and Company. Preparation of nitrobenzyl alcohol mesylates an tosylates. 3,745,188, Cl. 260-456.00r.

Bouiller, Jean Georges; Joubert, Raymond Jean Maurice; Lacroix, Armand Jean-Baptiste; and Bauer, Louis Jules, deceased (by Bauger, Madeleine Henreitte Aimee; and Olivier, Jeane Denise), said Bouiller, said Joubert and said Lacroix assors. to Societe Nationle d'Etude et de Construction de Moteurs d'Aviation. Bearing. 3,744,861, Cl. 308-187.000.

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Bowker, John Kent, to Itek Corporation. Method for producing diagrammed work surfaces on which are created artistic renderings of multi-color images. 3,745,037, Cl. 117-37.00r.

Boyd, Kenneth Williamson; Saltzberg, Burton R.; and Zydney, Herbert Mortimer, to Bell Telephone Laboratories, Incorporated. Composite clock signal generating and distributing circuits. 3,745,361, Cl. 307-3.000.

Bradbury, Roy R., II, to Popeil Brothers, Inc. Waste container and packer. 3,744,409, Cl. 100-102.000.

Bradley, Howard B., to Union Carbide Corporation. Manufacture of silicon metal from dichlorosilane. 3,745,043, Cl. 117-201.000.

Brammer, Harmut; Hohne, Gerd; Jakob, Gert; Kalippke, Harold; Sohner, Gerhard; Ehrmann, Karl; and Brand, Gunter, to Bosch, Robert, G.m.b.H. Ignition distributor with control generator for internal combustion engines. 3,744,466, Cl. 123-148.00e.

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Braudy, Robert S., to RCA Corporation. Laser writing. 3,745,586, Cl. 346-76.000.

Brauhut, Harold N. Wallet. 3,744,541, Cl. 150-35.000.

Braun Aktiengesellschaft: *See*—
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Braun, Daniel E., to Briggs & Stratton Corporation. Combined rope starter and guard for gasoline engines. 3,744,468, Cl. 123-185.00a.

Braun, Paul E.; and Obermeyer, Ernest J., to Ford Motor Company. Carburetor emission control. 3,744,471, Cl. 123-198.0db.

Brede, Dwight; Cook, Miles H.; Freeman, Marshall E.; and Turk, Harold L., to International Business Machines Corporation. Method of making magnetic head assembly. 3,744,127, Cl. 29-603.000.

Brede, Uwe: *See*—
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Brendgord, Thomas, to American Sterilizer Company. Environmental suit. 3,744,055, Cl. 2-2.000.

Brendzel, Henry T., to Bell Telephone Laboratories, Incorporated. Ripple-through counters having minimum output propagation delay times. 3,745,315, Cl. 235-92.0lg.

Brenneman, Richard Lee; and Zimmerman, Richard Henry. Electrical contact surface using an ink containing a plating catalyst. 3,745,045, Cl. 117-212.000.

Briggs & Stratton Corporation: *See*—
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Brindell, Gordon D.; and Dannals, Leland E., to Uniroyal, Inc. Antistatic polymer composition of polyhydric alcohol and alkali metal carbonate. 3,745,116, Cl. 252-1.000.

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Brolin, Ulf Erik; and Lindgren, Owe Gunnar, to Telefonaktiebolaget LM Ericsson. Amplifier arrangement for telephone instrument. 3,745,262, Cl. 179-81.00b.

Bromberg, Henry. Safety closure device. 3,744,654, Cl. 215-9.000.

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Brown, Edgar D., Jr.; and Berger, Abe. Silyl organometallocenes useful as antioxidants. 3,745,129, Cl. 252-49.700.

Brown, Eugene: *See*—
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Brown, Harold J., to Lorain Products Corporation. Regulator circuit having a multi-stepped regulating wave. 3,745,437, Cl. 321-5.000.

Brown, Henry; and Tomaszewski, Thaddeus W., to Oxy Metal Finishing Corporation, mesne. Electrodeposition of films of particles on cathodes. 3,745,098, Cl. 204-181.000.

Brown, James L.; and Hallett, Floyd P., to Mallinckrodt Chemical Works. Method for determining thyroxine in blood serum and reagent therefor. 3,745,211, Cl. 424-1.000.

Brown, Larry P., to Cities Service Oil Company. Apparatus and process for the solution and heating of sulfur containing natural gas. 3,744,565, Cl. 166-267.000.

Brown, Roger Frederick Challis; and Smith, Reginald James, to Monash University. Isoindole derivatives and preparation thereof. 3,745,174, Cl. 260-326.100.

Brown, William D., Jr.; and Gabrielson, Edward M., to United States of America, Navy. High security locking mechanism. 3,744,280, Cl. 70-54.000.

Bruce, Marshall H. Gravity interferometer system. 3,744,909, Cl. 356-106.000.

Brucken, Byron L., to General Motors Corporation. Agitating and spinning drive mechanism for a clothes washer. 3,744,325, Cl. 74-82.000.

Bruckner, Hermann; and Emsperger, Werner, to Kraftwerk Union Aktiengesellschaft. Once-through boiler with suspended tube system. 3,744,458, Cl. 122-6.00a.

Bruder, Frank J.; Parham, James F.; and Steuer, Victor F., to Bourns, Inc. Selectable fixed impedance device. 3,745,508, Cl. 338-320.000.

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Buchheit, Otto Karl, to Moefler & Neumann GmbH. Drive for the movable grate of a transverse feeding installation for rolled stock. 3,744,620, Cl. 198-219.000.

Buck, Marvin E.: *See*—
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Budzich, Tadeusz. Load responsive fluid control valves. 3,744,517, Cl. 137-596.200.

Buhler, Eugen. Apparatus for automatic production and transportation of flaskless sand moulds in metal casting. 3,744,549, Cl. 164-160.000.

Buhner, Willi, to Heinrich Koppers GmbH. Sintering machine. 3,744,778, Cl. 266-21.000.

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Burckhardt, Manfred H.; Florus, Hans-Jorg; Grossner, Horst; and Krohn, Helmut, to Daimler-Benz Aktiengesellschaft. Brake force regulating system for vehicles, especially for motor vehicles. 3,744,851, Cl. 303-21.0be.

Burckhardt, Manfred H.; Lutze, Walter; and Schwerdt, Paul, to Daimler-Benz Aktiengesellschaft. Frequency transmitter especially for brake slippage control systems of motor vehicles. 3,745,390, Cl. 310-71.000.

Burgarella, John P.; Carcia, Peter P.; and Kee, Richard C., to Polaroid Corporation. Control system for photographic apparatus. 3,744,385, Cl. 95-11.00r.

Burgess, James F.; and Neugebauer, Constantine A., to General Electric Company. Direct bonding of metals with a metal-gas eutectic. 3,744,120, Cl. 29-494.000.

Burgess, Norman E., to Domtar Limited. Internal interlocking flap box. 3,744,699, Cl. 229-23.00r.

Burke, Robert C. Fish-supporting and holding device. 3,744,090, Cl. 17-70.000.

Burnage, David, to John Disenbery Company, Inc. Knife assemblies for winding machines. 3,744,730, Cl. 242-56.00a.

Burnett, George E. House trailer ground anchor. 3,744,192, Cl. 52-23.000.

Burnham, Fred E., to Litton Systems, Inc. Digital beam displacement circuit. 3,745,580, Cl. 343-100.0sa.

Burns, Henry L., to Covitron Corporation. Nebulizer. 3,744,722, Cl. 239-338.000.

Burroughs Corporation: *See*—
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Busch, Richard E., to Addmaster Corporation. Resilient support. 3,744,747, Cl. 248-22.000.

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Calgon Corporation: *See—*
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Calkin, Edwin Theodore; Hamilton, Billy Harold; and La Porta, Frank Carl, to Bell Telephone Laboratories, Incorporated. Switching regulator with network to reduce turnon power losses in the switching transistor. 3,745,444, Cl. 323-17.000.
Caldwell, Samuel L., to Caterpillar Tractor Company. Disconnect device. 3,744,331, Cl. 74-405.000.
Calgon Corporation: *See—*
Szabo, Miklos Tamas; Boothe, Jerry Emile; Sharpe, Andrew Jackson, Jr.; and Martin, Fred David, 3,744,566.
Calkin, Edwin Theodore; Hamilton, Billy Harold; and La Porta, Frank Carl, to Bell Telephone Laboratories, Incorporated. Switching regulator with network to reduce turnon power losses in the switching transistor. 3,745,444, Cl. 323-17.000.
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Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Time division switching arrangement utilizing a hybrid circuit. 3,745,256, Cl. 179-15.0at.
Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Nonlinear charge redistribution PCM coder. 3,745,555, Cl. 340-347.0ad.
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Carnes, Robert A., to Motorola, Inc. Power semiconductor device mountable on either its top or bottom surface. 3,745,422, Cl. 317-234.00r.
Carnier, Jacques, to Institut Francais du Petrole des Carburants et Lubrifiants. Positive clutch and brake with limit switch. 3,744,603, Cl. 192-16.000.
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Clark, Charles William. Automatic coin-operated photographic apparatus utilizing self-developing film units. 3,744,390, Cl. 95-14.000.
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Cook, Shirl E.; and Sistrunk, Thomas O., to Ethyl Corporation. Thermal stabilization of tetramethyllead. 3,745,185, Cl. 260-437.00s.
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Muller, Dieter; and Jurisch, Wilhelm, 3,744,241.
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Daines, William Robert; and Cartwright, John Anthony, to Thorn Electrical Industries, Limited. Panel structure for mounting electrical components to provide front access thereto. 3,745,565, Cl. 340-381.000.
D'Albert, Joseph: *See—*
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Dallas, Richard, to Johnson, Owen. Typing pacer. 3,744,157, Cl. 35-35.00b.
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Dangles, Thomas C.; and Dangles, Elsie R. M. Pill dispenser. 3,744,672, Cl. 221-82.000.
Daniel, Daniel S.; and Heseltine, Donald W., to Eastman Kodak Company. Novel borinium cyanine dyes. 3,745,160, Cl. 260-240.00d.
Daniel Industries, Inc.: *See—*
Siroman, Larry J., 3,745,318.
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Lundsgart, Henning Borge, 3,744,552.
Darbo, Rolf E. Temperature limit alarm. 3,745,545, Cl. 340-227.100.
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Daugny, Bertrand; and Schifrine, Jean, to Electronique Marcel Dassault. Radar telemetering system. 3,745,574, Cl. 343-7.00a.
Davidson, Evan E.; Lane, Ralph D.; and Saia, Jerry, to International Business Machines Corporation. Latch type regenerative circuit for reading a dynamic memory cell. 3,745,539, Cl. 340-173.00r.
Davies, Guy Edward, to Plessey Company Limited, The. Momentum-interaction type fluidic devices. 3,744,525, Cl. 137-823.000.
D'Avino, Salvatore. Phase meters for the indirect measurement of power factor. 3,745,457, Cl. 324-83.00r.
Davis, Donald W. Pipe cleaning nozzle. 3,744,723, Cl. 239-543.000.
Davis, John Arthur, to Dresser Industries, Inc. Semi-hydraulic lift and improved valve therefor. 3,744,372, Cl. 91-4.00a.
Davis, John Derek, to Ricardo & Co., Engineers (1927) Limited. Method and means for reducing exhaust smoke in I.C. engines. 3,744,461, Cl. 123-32.0ea.
Dawson, John: *See—*
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Day, Christopher C., to American Optical Corporation. Digital cathode ray tube intensity-modulator. 3,745,407, Cl. 315-30.000.
DBM Industries Limited: *See—*
Caroli, Italo, 3,744,948.
De Benneville, Peter L.; and Greenberger, Norton J., to Rohm and Haas Company. Method for evaluating pancreatic enzyme sufficiency and compounds useful therein. 3,745,212, Cl. 424-9.000.
De Brey, Heinrich; and Roos, Pieter, to U.S. Philips Corporation. Telescope including an imaging system for radiation in the visible range. 3,745,347, Cl. 250-83.30r.
De Frees, Joseph H. Combination manhole and fill. 3,744,670, Cl. 220-57.000.
De Groot, John E.; and Fuerst, Bernard, to Benfur Manufacturing Company. Suspension structure of liner plates. 3,744,190, Cl. 51-268.000.
De Koe, Oscar Bernardus Philomenus Rikkert; and Bijker, Arnold Jan, to U.S. Philips Corporation. Modular synchronous buffer unit for a buffer having a capacity depending on the number of interconnected identical buffer units. 3,745,535, Cl. 340-172.500.
De Laval Separator Company, The: *See—*
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De Long, Donald C.; Lively, David H.; and Neuss, Norbert, to Lilly, Eli, and Company. Antiviral antibiotic. 3,745,158, Cl. 260-243.00r.
De Monet, George Nomine. Process and apparatus especially for commercial translations and the resultant product. 3,744,155, Cl. 35-35.00r.
De Vos, Maarten, "Fokker-V.F.W." N.V. Duct and electrical connector assembly. 3,745,229, Cl. 174-101.000.
Dean Foods Company: *See—*
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Deas, Richmon E.: *See—*
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Deimen, Lawrence A., 10% to Deimen, James M. Metallurgical grain refinement process. 3,744,997, Cl. 75-129.000.
Deitch, Gershon. Sanitary waste receiver and guide rod device for dogs. 3,744,453, Cl. 119-1.000.
Del Castillo, Juan M. Indicating head for use with a keyboard instrument teaching device. 3,744,366, Cl. 84-478.000.
Delao, Alexander. Corrugated board paint filter. 3,744,222, Cl. 55-446.000.
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Dennis, Ralph E.; Green, Robert C.; Honn, James J.; and Nottingham, James H., to International Business Machines Corporation. Two-dimension repeatable, positionabhe table. 3,744,891, Cl. 353-27.000.
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Didycz, William J., to United States Steel Corporation. Process for stripping hydrogen cyanide from pyridine salt solutions. 3,745,166, Cl. 260-296.00d.
Dinkler, Leonard R.; and Evjen, John M., to General Electric Company. Battery cooling system. 3,745,048, Cl. 136-166.000.
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Dochterman, Richard W., to General Electric Company. Dynamoelectric machine having improved, bearing and support structure. 3,745,391, Cl. 310-90.000.
Doenecke, Christian; and Redel, Karl-Georg, to Leybold-Heraeus-Verwaltung GmbH. Method and apparatus for refining the metal of consumable electrode. 3,744,989, Cl. 75-10.00r.
Doerner, William A., to Du Pont de Nemours, E. I., and Company. Rotary closed rankine cycle engine with internal lubricating system. 3,744,246, Cl. 60-95.000.
Dohi, Takao; and Oishi, Nobuhisa, to Todo Seisakusho Ltd. Heald separating apparatus. 3,744,109, Cl. 28-46.000.
Dohse, Rothard; Edeling, Curt; and Eisenmann, Josef, to Elektro-Thermit GmbH. Tongue device with pivotal connecting rails. 3,745,336, Cl. 246-442.000.
Dolce, Leonard J.; Greer, Henry W.; and Martell, George E., to Smith Kline & French Laboratories. Capsule salvage machine. 3,744,214, Cl. 53-381.00r.
Dolgolenko, Anatoly Alexandrovich; Onokhov, Pavel Pavlovich; and Makhover, Jury Meerovich. Air cushioned belt conveyor. 3,744,619, Cl. 198-184.000.
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Dotson, Anderson O., Jr.; Green, Joseph; and Wolford, Lionel T., to Cities Service Company. Fire retardant polymer composition. 3,745,146, Cl. 260-45.75b.
Douglas, James K., to Oilgear Company, The. Pintle pump. 3,744,378, Cl. 91-484.000.
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Drzewiecki, Tadeusz M.; and Manion, Francis M., to United States of America, Army. Pure fluidic strain gage. 3,744,303, Cl. 73-88.00r.

D'Sal Products, Inc.: *See—*
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Du Bois, Edward F., to Singer Company, The. Lead straightner for axial lead components. 3,744,535, Cl. 140-147.000.

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Dumbaugh, George D., to Vibranetics, Inc. Means for suspending and vibration isolating flow promoting apparatus from a flowable material container. 3,744,676, Cl. 222-161.000.

Dunbar, George, to ESB Incorporated. Plastic hinge for spectacles. 3,744,887, Cl. 351-153.000.

Dunbar, Neil F.: *See—*
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Duncan, Thomas W.; and Hiers, Sylvan L., to Design and Manufacturing Corporation. Wheel mounting means for dishwasher racks. 3,744,646, Cl. 211-162.000.

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Dunne, Edmund F., to Clopay Corporation. Garment storage bag display 206/044.00r. 3,744,624, Cl. .

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Duron Industries, Ltd.: *See—*
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Dymond, Joseph Francis. Footwear. 3,744,160, Cl. 36-2.5ae.

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Eagle Machine Company Limited: *See—*
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Earthing, Winfield H.; and Frisbie, Herbert F., to United States of America, National Aeronautics and Space Administration. Device for determining relative angular position between a spacecraft and a radiation emitting celestial body. 3,744,913, Cl. 356-14.000.

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Ebert, Paul, to Aeropur, A.G. High-voltage ozone-free electrostatic air filter. 3,744,217, Cl. 55-118.000.

Ebert, Paul, to Aeropur, A.G. Apparatus for cleaning gases through ionization. 3,744,218, Cl. 55-118.000.

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Edenhofer, Albrecht; and Spiegelberg, Hans, to Hoffman-La Roche Inc. 3α,12β-8H-dibenzo(3,4,6,7)cycloheptˆ(1,2-d)oxazol-8-ones and processes for their preparation. 3,745,167, Cl. 260-307.00d.

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Eguchi, Isamu; and Akama, Kazma, to Daido Steel Co., Ltd. Strip floating-apparatus. 3,744,961, Cl. 432-59.000.

Ehrlich, Benjamin. Tiller attachment for power mowers. 3,744,569, Cl. 172-42.000.

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Eltze, Georg: *See—*
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Emerson, S. Thomas; Simpson, W. Dwain; and Sutter, Richard J., to Periphonics Corporation. Analog signal recording and playback method and system. 3,745,264, Cl. 179-100.2md.

Emery Industries, Inc.: *See—*
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E.M.I. Limited: *See—*
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Emicke, Klaus; and Goralczyk, Wilhelm, to Norddeutsche Affinerie. Method of separating copper from nickel. 3,744,994, Cl. 75-101.00r.

Emmett, Robert C., Jr.; and Dahlstrom, Donald A., to Envirotech Corporation. Method for steam drying filter cake. 3,744,543, Cl. 159-49.000.

Emmons, Lawrence D., to Ampex Corporation. Intelligence transducing beam modulation method and apparatus. 3,745,408, Cl. 315-30.000.

Emsperger, Werner: *See—*
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English Electric Company Limited, The: *See—*
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Erekson, Arthur B., to Borden Inc. Method for making absorbent pads. 3,745,081, Cl. 156-264.000.

Ergenc, Mehmet Sahabettin; and Hartmann, Fortunat, to Sulzer Brothers Ltd. Process and apparatus for abstracting heat from a flow of gas. 3,745,050, Cl. 165-1.000.

Erickson, George F.; and Stratton, Thomas F., to United States of America, Atomic Energy Commission. Electrodes for obtaining uniform discharges in electrically pumped gas lasers. 3,745,481, Cl. 331-94.500.

Erickson, Richard L.: *See—*
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Erlichman, Irving, to Polaroid Corporation. Film processing apparatus for use with a photographic camera. 3,744,388, Cl. 95-13.000.

Ertsgaard, Edwin P., to United States of America, Navy. Gaseous optical filter. 3,744,423, Cl. 102-70.20p.

Erwin, Floyd Dennis, to Hughes Aircraft Company. Modular digital processing equipment. 3,745,532, Cl. 340-172.500.

Erwin, Floyd Dennis; and Postma, William S., to Hughes Aircraft Company. Digital data storage register modules. 3,745,533, Cl. 340-172.500.

ESB Incorporated: *See—*
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Skelton, Jon V.; and Relation, Alfred E., 3,745,548.

Eshler, Donald C., to United States Gypsum Company. Unit platform. 3,744,204, Cl. 52-671.000.

Espana, Salvador; and Font, Brunson Bert, to McCulloch Corporation. Hard faced chain saw guide bar. 3,744,363, Cl. 143-32.00h.

Espinosa, Francisco Gutierrez: *See—*
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Falivene, Vincent. Selected width bed frame. 3,744,066, Cl. 5-176.000.

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Carbone, Angelo F.; Egerton, Clinton F.; and Fallacaro, Emmanuele, 3,744,835.

Fanciullo, Salvatore; Gagnon, Richard N.; and Summers, Warren S., to United Aircraft Corporation. Proportional action electronic fuel control for fuel cells. 3,745,047, Cl. 136-86.00b.

Fankhouser, Cyril E., to Technicolor, Inc. Retractable handle for case. 3,744,084, Cl. 16-114.000.

Farha, Floyd, Jr.: *See—*
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Faulkner, Edward A. Fuel-leak detector and safety system. 3,744,954, Cl. 431-16.000.

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Fears, Lowell T., to D'Sal Products, Inc. Applicator for fluids. 3,744,922, Cl. 401-190.000.

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Felix, Ernst, to Zellweger Ltd. Method and apparatus for regularizing the output of drawing frames of the kind used in textile spinning. 3,744,093, Cl. 19-240.000.

Fendrich, Charles Nelson, Jr., to AMP Incorporated. Regulated floating output. 3,745,363, Cl. 307-34.000.

Fennelly, Richard P. Process and apparatus for containment of aqueous pollutants. 3,744,254, Cl. 61-1.000.

Fensch, Walter, to BASF Wyandotte Corporation. Resilient cellular polyurethanes. 3,745,134, Cl. 260-2.5am.

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Ferkich, Richard F. Collapsible frame structure. 3,744,195, Cl. 52-63.000.

Fernandez, Heriberto S. Automatic device for recording blood pressure. 3,744,490, Cl. 128-2.050.

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Fieldcrest Mills, Inc.: *See—*
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Filipovich, Danny; Carlson, Richard K.; and Hadzimahalis, Theodore M., to Bell & Howell Company. Lens mount assembly for focusable, variable focal length lens. 3,744,884, Cl. 350-255.000.

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Filitz, Otto, & Co. Fabrik Optischer: *See—*
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Firtz, Richard B.; Livesay, William R.; and Wing, Malcolm E., to Radiant Energy Systems, Inc. Alignment method and apparatus for electron projection systems. 3,745,358, Cl. 250-365.000.

Fischer, Albert K., to United States of America, Atomic Energy Commission. Process of preventive nitridation of steel submerged in liquid sodium. 3,745,068, Cl. 176-38.000.

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Fischer, Boguslav H., to Fischer, Boguslav H. Low pressure localized hyperbaric oxygen chamber. 3,744,491, Cl. 128-184.000.

Fischer, Raymond Frank, Jr., to Ciba-Geigy. Tamperproof container for vials or the like. 3,744,661, Cl. 220-21.000.

Fischer, Roman: *See—*

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Fisher, Aaron; and Clatterbuck, Carroll H., to United States of America, National Aeronautics and Space Administration. Process for making R.F. shielded cable connector assemblies and the products formed thereby. 3,744,128, Cl. 29-629.000.

Fisher, John H., to British Columbia Forest Products Limited. Process for simultaneous turpentine recovery an odor control. 3,745,063, Cl. 162-15.000.

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Fleury, Gerard, to Societe Nationale Industrielle Aerospatiale. System for determining the fatigue of a structure experiencing varying stresses. 3,744,300, Cl. 73-67.300.

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Flynn, Charles S., to National Lumberman's Bank & Trust Company; as trustee for Blu Surf Thermo Engineering Trust. Heat treatment. 3,744,963, Cl. 432-59.000.

Foll, William A.; and Buckner, Leonard. Precision spirally wound sleeve. 3,744,531, Cl. 138-144.000.

Folson, Henry J., to Mattel, Inc. Sound illustrated book. 3,744,150, Cl. 35-8.00a.

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Fontes, Eugene A.: *See—*
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Formac International Inc., mesne: *See—*
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Foro, David Julian, to TRW Incorporated. Non-releasable clasp. 3,744,104, Cl. 24-248.0sl.

Forster, Harry D., Jr., to Holograph Corporation. Composite lens for an optical communication system providing directly viewed real images. 3,744,882, Cl. 350-241.000.

Fort Lock Corporation: *See—*
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Foster, Michael R.; Jalbing, John I.; and Patterson, Lester E.; deceased (by Patterson, Marie L.; administratrix). Catalytic convertor temperature control system. 3,744,248, Cl. 60-286.000.

Foster, Robert D. Pipe sling. 3,744,837, Cl. 294-74.000.

Fountain Industries, Inc.: *See—*
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Fournier, Roger, to Regie Nationale des Usines Renault. Non-stick treatment of mold cavities. 3,745,096, Cl. 204-20.000.

Fowler, James M. Cable aviary structure and method of erecting the same. 3,744,455, Cl. 119-17.000.

Fowler, John Edward, to Pressed Steel Fisher Limited. Vehicle seat belts and harnesses. 3,744,732, Cl. 242-107.0sb.

Fowler, Joseph A.: *See—*
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Franck, Raymond J.; and Corley, Dewey A. Recirculation system for meltdown water from an ice storage compartment. 3,744,263, Cl. 62-98.000.

Frank, Carl A. Modular pulley capable of being assembled to various desired lengths and automatic belt-steering pulley assembly. 3,744,329, Cl. 74-230.100.

Frank, Charles, Limited: *See—*
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Frankel, Sidney: *See—*
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Franklin, Paul R., Jr. Holdover cold plate cooling unit. 3,744,271, Cl. 62-430.000.

Frantti, Edsel W.; and Gelzheiser, Francis L., to Westinghouse Electric Corporation. Ground fault circuit interrupter. 3,745,414, Cl. 317-18.00d.

Fraze, Ermal C.: *See—*
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Fraze, Ermal C.; and Silver, Francis M., to Fraze, Ermal C. Can end with retained tear strip. 3,744,667, Cl. 220-48.000.

Frederick, Dean M. Axial air gap motor. 3,745,388, Cl. 310-49.000.

Freeborn, John C., to Honeywell Inc. Amplifier apparatus for use with an inductive load. 3,745,477, Cl. 330-13.000.

Freedman, Nathan: *See—*
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Freeman, Frank George, to Lucas, Joseph, (Industries) Limited. Rotary hydraulic machines. 3,744,379, Cl. 91-497.000.

Freeman, Marshall E.: *See—*
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Freitas, Ernest R.: *See—*
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Fretwell, Richard D., to Design Elements, Inc. Data terminal automatic control circuit. 3,745,251, Cl. 179-2.0dp.

Freudenberger Winden und Hebezeuafabrik: *See—*
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Frisbie, Herbert F.: *See—*
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Frost, Carl A. Light fixture. 3,745,330, Cl. 240-78.00f.

Frost, Harold. Artificial hip joint and method of implanting in a patient. 3,744,061, Cl. 3-1.000.

Frost, Solsmsn. Contact photocopy apparatus. 3,744,903, Cl. 355-117.000.

Frutiger, Peter; and Schuler, Rolf, to Anstalt Europaische Handelsgesellschaft. Apparatus for selectively coupling electrical signals and scanning and recording devices to movable data carrier. 3,745,534, Cl. 340-172.500.

Fuchs, Hubert, to De Laval Separator Company, The. Biological decomposition of organic material. 3,745,113, Cl. 210-12.000.

Fudemoto, Isao; Kurita, Shichi; Tomimori, Kiyoshi; and Hayashi, Tatsuki, to Fujitsu Limited. PCM regenerative repeater. 3,745,257, Cl. 179-16.00e.

Fuerst, Bernard: *See—*
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Fuji Electrochemical Co., Ltd.: *See—*
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Fujio, Masaaki. Dripping bottle. 3,744,658, Cl. 215-100.00a.

Fujisawa, Tamotsu; Tsuchihashi, Genichi; Takahashi, Toshiro; Nakamura, Masanobu; and Okada, Yoshihiro, to Sagami Chemical Research Center and Daikyo Oil Co., Ltd. Lubricating oil composition. 3,745,117, Cl. 252-48.200.

Fujishiro, Yasuo, to Iwatsu Electric Co., Ltd. Controllable junction device and radiation-generating method of utilizing it. 3,745,429, Cl. 317-235.00r.

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Fuller, David L., to Scripto, Inc. Camera with apparent image motion and direction compensation. 3,744,387, Cl. 95-12.500.

Funke, Ralph A. Compression paste tube dispenser. 3,744,674, Cl. 222-103.000.

Funke, Richard A., to Allen Bradley Company. Reed switch cartridge. 3,745,493, Cl. 335-206.000.

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Fuse, Yuzo, to Sony Corporation. Misconvergence compensating device for color cathode ray tubes. 3,745,405, Cl. 315-13.0cg.
Fussell, Donald L., to Mark Products, Inc. Multiconductor cable connector. 3,745,511, Cl. 339-49.00r.
Futagawa, Yoshikiyo; and Komatsu, Chiaki, to Kabushiki Kaisha Suwa Seikosha. Driving circuit for brushless motor. 3,745,435, Cl. 318-254.000.
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Gardner, Louis T., to Le Blond Incorporated. Machine tool retrieval and interchange system. 3,744,124, Cl. 29-568.000.
Gardner, Orian R. Burner for light combustible materials. 3,744,440, Cl. 110-18.00r.
Gardner, Selby A.; and Krackenberger, Robert J., to Lilly, Eli, and Company. Structure for folding carton. 3,744,708, Cl. 229-48.00r.
Garth, Emory C., to Texas Instruments incorporated. Synchronous digital system having a clock distribution system. 3,745,472, Cl. 328-63.000.
Gary, Rex I., Jr.; and Kille, Charles Alden, to Glastron, Inc. Glass ball valve. 3,744,755, Cl. 251-309.000.
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Gause, Raymond L.; and Bynum, Bobby G., to United States of America, National Aeronautics and Space Administration. Erometer. 3,744,480, Cl. 128-2.05r.
Gause, Raymond L.; and Spier, Raymond A., to United States of America, National Aeronautics and Space Administration. Restraint system for ergometer. 3,744,794, Cl. 272-73.000.
Gaylord, John A., to Koch, H., & Sons, Inc. Strap connector release. 3,744,102, Cl. 24-230.00a.
Gaylord, John A., to Koch, H., & Sons, Inc. Lock and release for strap connector. 3,744,103, Cl. 24-230.00a.
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Gebel, Kurt M., to Landis Tool Company. Gas spring for transducer on gaging device. 3,744,135, Cl. 33-169.00r.
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Geleman, Ephrem J. Apparatus for cutting glass bottles and the like. 3,744,359, Cl. 82-92.000.
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Geyer, Paul. Extrusion method. 3,745,200, Cl. 264-37.000.
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Gobeil, Richard J.; and Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Zinc chloride-ammonium chloride complexes as flame retardants. 3,745,144, Cl. 260-45.75r.
Godfrey, Charles S., to Physics International Co. Erosion well drilling method and apparatus. 3,744,579, Cl. 175-67.000.
Godin, Pascal Albert; Seite, Guy Henri; DuPont, Bertrand Georges; and Vidal, Max Laurent, to Societe Anonyme d'Etudes et Realisations Nucleaires Sodern. High precision stellar pointing device for spacecraft. 3,744,740, Cl. 244-3.190.
Goettl, Adam D. Carrier. 3,744,836, Cl. 294-67.0ba.
Goldberg Brothers, Inc.: *See—*
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Goldberg, Noran P., to Goldberg Brothers, Inc. Lid latch. 3,744,828, Cl. 292-59.000.
Golden Cycle Corporation, mesne: *See—*
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Goldmacher, Irving I., to United Aircraft Corporation. Variable squint and beamwidth amplitude monopulse radar. 3,745,577, Cl. 343-16.00m.

Goldman, Arnold J.: *See—*
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Gonda, Tsunemi, to Nippon Kogaku K.K. Automatic positioning device. 3,744,914, Cl. 356-152.000.

Good, Carl D.; Poole, Donald R.; and Schmidt, Eckart W., to Rocket Research Corporation. Fuel grain with open-celled matrix containing lithium. 3,744,427, Cl. 102-100.000.

Goodall Manufacturing Corporation: *See—*
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Gopin, Albert J., to Hughes Aircraft Company. Thermal radiation shield. 3,744,478, Cl. 126-270.000.

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Gorbunov, Georgy Vasilievich: *See—*
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Gorman, Harry. Assembly for making a paper board sound recording package. 3,745,055, Cl. 161-102.000.

Goto, Yoshiyuki: *See—*
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Goyette, Fernand, to Northern Electric Company Limited. System for detecting faults in twisted wires by sensing variations in. 3,745,451, Cl. 324-51.000.

Graber-Rogg Inc.: *See—*
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Granitz, Richard Francis, to AMP Incorporated. Slide selector switch assembly. 3,745,270, Cl. 200-16.00c.

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Grant, John M., to International Telephone and Telegraph Corporation. Microchannel plate gas display panel. 3,745,554, Cl. 340-324.00r.

Grant, Ralph M.: *See—*
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Grantham, Paulette. Continuous laundering. 3,744,277, Cl. 68-53.000.

Grasse, Charles Louis: *See—*
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Grataloup, Xavier Roger, to Societe Anonyme: Nodet-Gougis. Proportioning device for granulated or pulverulent products. 3,744,725, Cl. 239-669.000.

Gray, Martin Ernest; Whittaker, Dennis William; and Appleton, David, to Pilkington Brothers Limited. Cutting glass. 3,744,690, Cl. 225-2.000.

Grebow, Wolfe. Washer shaping tool. 3,744,069, Cl. 7-4.000.

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Greiner, Harry M., to Roland Offsetmaschinenfabrik, Faber & Schleicher AG. Turning bar for the deflection of paper webs. 3,744,693, Cl. 226-97.000.

Grennan, Charles W.; and Cygnor, John L., to Chandler Evans, Inc. Variable displacement vane pump. 3,744,939, Cl. 418-30.000.

Greve, Heinz, to Hauni-Werke Korber & Co. KG. Method and apparatus for making rod-shaped fillers for cigarette filters or the like. 3,744,108, Cl. 28-1.0cf.

Griego, Steven J. Lockable hinge. 3,744,085, Cl. 16-144.000.

Griffin, Judson R.; Martin, Donald L., Jr.; and Siron, Robert E., to United States of America, Army. Quadruple lap simple shear test specimen. 3,745,051, Cl. 161-44.000.

Grimm, Richard C., to Susquehanna Corporation, The. Explosive-disseminator package. 3,744,425, Cl. 102-85.000.

Grisdale, Patrick J., to Eastman Kodak Company. Benzo (beta) pyrylium dye salts. 3,745,176, Cl. 260-335.000.

Grob, Russel W., to Caterpillar Tractor Company. Pulse transmitter circuit for measuring instruments. 3,745,470, Cl. 328-38.000.

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Gross, Robert D., to Singer Company, The. Strain relieving electrical connector. 3,745,513, Cl. 339-95.00r.

Gross, Thomas A. O., to Arrow-Hart, Inc. Thyristor control circuits including means for sensing the presence of an object. 3,745,379, Cl. 307-252.00b.

Grosse-Brauckmann, Ehrenfried; Kick, Hermann; and Nettesheim, Gottfried, to Union Rheinische Braunkohhen Kraftstoff Aktiengesellschaft. Method for the production of horticultural soils. 3,744,986, Cl. 71-24.000.

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Grover, Douglas U., to Glasrock Products, Inc. Laboratory intake filter. 3,744,640, Cl. 210-463.000.

Grue, John Edward; and Petro, Karl Carmen. Stencil type chalk fabric marker. 3,744,412, Cl. 101-114.000.

Grunert, Kurt A., to Westinghouse Electric Corporation. Electromagnetic contactor with safety latch device. 3,745,492, Cl. 335-167.000.

Grunert, Richard D.: *See—*
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GTE Automatic Electric Laboratories, Incorporated: *See—*
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Gundlach, Robert W., to Xerox Corporation. Transparent electrode for electrophonetic imaging. 3,744,897, Cl. 355-3.000.
Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Machine for producing moulds consisting of identical mould parts that are lined up against each other. 3,744,551, Cl. 164-183.000.
Gurkov, Konstantin Stepanovich: *See—*
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Gutman, Arnold D., to Stauffer Chemical Company. Oximino phosphorus compounds. 3,745,186, Cl. 260-453.00r.
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Haffner, Donald G.; and Hubbard, Glenn R., to Jacobson Manufacturing Company. Multiple outlet spool valve. 3,744,522, Cl. 137-625.170.
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Hagel, Adolf; and Sell, Helmut, to LIBA Maschinenfabrik G.m.b.H. Knitting and weaving machine. 3,744,276, Cl. 66-84.00r.
Hagerty, William K.; and Hunter, Travis L., to Vantage Tool Incorporated. Pneumatic hole piercing apparatus. 3,744,291, Cl. 72-325.000.
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Hague, John D. Rotating body unbalance detector-locator. 3,744,321, Cl. 73-457.000.
Haigh, Geoffrey T., to Particle Data, Inc. Current normalizer for particle size analysis apparatus. 3,745,455, Cl. 324-71.0cp.
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Hall, George Robert. Musical instrument having automatic fill-in means. 3,745,225, Cl. 84-1.030.
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Halloran, John J., to Environmental Technology Corporation. Air purifier. 3,744,216, Cl. 55-102.000.
Hallum, Charles E., to Philco-Ford Corporation. Engine emission control device. 3,744,251, Cl. 60-324.000.
Haluska, Loren A.; and Ryan, John W., to Dow Chemical Corporation. Removal and recovery of soluble platinum catalysts. 3,745,206, Cl. 423-22.000.
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Hand, Hugh T., to Hand Chemical Industries Limited. Pyrotechnic device. 3,744,419, Cl. 102-37.700.
Hanke, Hans; and Bultmann, Friedrich, to Daimler-Benz Aktiengesellschaft. Installation for the unloading of shaft seals in hydrodynamic brakes for vehicles, especially for motor vehicles. 3,744,598, Cl. 188-296.000.
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Hansen, Gunnar Lyshoj; and Petersen, Jorgen Hartvig, to Danfoss A/S. Pressure-regulating valve, particularly for fuel-oil pumps. 3,744,508, Cl. 137-116.300.
Hansen, Knute C.; and McKeown, John C., to United Aircraft Corporation. Rotor overload protection. 3,744,928, Cl. 416-31.000.
Hansen, Lars J., to Environmental Technology, Inc. Process for the recovery of waste pickle liquor. 3,745,207, Cl. 423-154.000.
Hansen, Ralph R.; Ray, Thomas A.; and Reimer, Gerhard M., to Swift & Company. Carcass chilling process. 3,745,026, Cl. 99-194.000.
Hanson, Ivor G.; Herbst, George; and Lewis, Jerry M. Method for explosively bonding together metal layers and tubes. 3,744,119, Cl. 29-470.100.
Hanson, Jack Orvel; and Ross, Robert Martin, to General Electric Company. Apparatus for monitoring suspended aerosols and particulates in a gas. 3,744,297, Cl. 73-28.000.
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Hardwick, David R.; and Kersting, Raymond J., to Wagner Electric Corporation. Control valve. 3,744,848, Cl. 303-9.000.
Hardy, Shelia. Device for reclaiming dry powder particulates. 3,744,450, Cl. 118-326.000.
Harlan, Martin L.; and Kalvitz, Paul V., to Wolverine World Wide, Inc. Universal single side skinning machine. 3,744,407, Cl. 99-589.000.
Harmes, Clyde S., III, to New Brunswick Scientific Co., Inc. Liquid-sampling structure. 3,744,319, Cl. 73-422.00r.
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Harnden, John D., Jr.; and Kornrumpft, William P., to General Electric Company. Inductively heatable utensils or vessels for heating, serving and storing food. 3,745,290, Cl. 219-10.490.
Harper, James C.; and Green, Robert P., to Geophysical Research Corporation. Pressure gauge. 3,744,307, Cl. 73-151.000.
Harper, Robert C., to Cincinnati Milling Machine Co., The. Process for molding polyurethane utilizing a mixture of two blowing agents. 3,745,203, Cl. 264-48.000.
Harris, Allan E., to Harris-Hub Company, Inc. Adjustable bed frame member. 3,744,068, Cl. 5-181.000.
Harris, Fritz B. Method for making artificial fuel from paper and product. 3,744,980, Cl. 44-1.00r.
Harris, John L., to Deltrol Corporation. Motor release energy storage means for retarded type timer mechanism. 3,745,273, Cl. 200-40.000.
Harris, Ronald, to Stibbe Machinery Limited. Patterning mechanism for multi-feed circular knitting machines and to a method of knitting on the same. 3,744,275, Cl. 66-42.000.
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Hayes, Saul. Tennis ball pocket. 3,744,059, Cl. 2-250.000.

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Hecker, Joel; and Zinke, Robert, to United States of America, Navy. Logarithmic amplifier and limiter. 3,745,374, Cl. 307-230.000.

Hedges, Joseph Ross. Rotary engine. 3,744,926, Cl. 415-92.000.

Heenan, Sidney A.; Majewski, Norbert; and Montalbano, Anthony J., to Amerace Esna Corporation. Method for making a curved cube-corner reflector. 3,744,117, Cl. 29-416.000.

Heffner, Robert E., to Aluminum Company of America. Easy opening device in a container wall. 3,744,666, Cl. 220-98.000.

Hehl, Karl. Locking unit for the casting mold of an injection molding machine with protective hood. 3,744,949, Cl. 425-153.000.

Heidelberger Drucksnaschinen Aktiengesellschaft: *See—*
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Heine, Joseph O.; and Simmons, Duwayne. Animal restraining apparatus. 3,744,457, Cl. 119-103.000.

Heinrich Koppers GmbH: *See—*
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Heinrich, Richard, to Kupfer-Asbert-Co. Gustav Bach. Slide ring for axially acting shaft sealing rings. 3,744,805, Cl. 277-96.000.

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Helbling, Roman A. Sucking flake hand dryer. 3,744,149, Cl. 34-202.000.

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Helmer, Josef; and Eltze, Georg, to Daimler-Benz Aktiengesellschaft. Elastic plug-type pipe connection. 3,744,343, Cl. 74-645.000.

Helsley, Grover Cleveland, to Robins, A. H., Company, Incorporated. 1,2,3,4-tetrahydroisoquinoline-2-(thio) -carboxamides. 3,745,162, Cl. 260-283.00s.

Hemphill, Robert W., to Sekur-It Products, Inc. Office equipment locking device. 3,744,282, Cl. 70-58.000.

Henderson, William Arthur, Jr.: *See—*
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Henebry, Thomas F.; and Platter, Sanford, to Semiconductor Electronic Memories Incorporated. Boat mover for semiconductor fusion process. 3,744,650, Cl. 214-23.000.

Henke, John R. Converter accessory for calipers. 3,744,136, Cl. 33-169.00r.

Henker, Heinz, to Siemens Aktiengesellschaft. Device for producing a photo-varnish mask. 3,744,902, Cl. 355-53.000.

Henning, Robert W.; and Kucmerosky, Theodore L., to Olin Corporation. Fastener driving tool. 3,744,240, Cl. 60-26.100.

Henry, Malcolm C.; MacNair, Richard N.; and Erickson, Richard L., to United States of America, Army. Protective clothing fabric. 3,744,534, Cl. 139-426.000.

Henry, Patrick M., to Hercules Incorporated. Production of carboxylic acids, esters, acid chlorides, anhydrides, and ketones by reaction of an organometallic compound with carbon monoxide. 3,745,173, Cl. 260-332.20c.

Herbener, Albert, to NRM Corporation. Thermoforming apparatus. 3,744,617, Cl. 198-135.000.

Herbert, Lawrence W., to Vorta Systems, Inc. Omni-directional transmitting and receiving antenna. 3,745,583, Cl. 343-742.000.

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Hernon, Lon. Book marker. 3,744,447, Cl. 116-119.000.

Herr, Harry C. Cigarette lighter with time lock. 3,744,953, Cl. 431-13.000.

Herrera, Juan Hernandez. Apparatus for producing a beverage. 3,744,397, Cl. 99-293.000.

Herschmann, Otto; Mettig, Hermann; Medenus, Bernhard; Howe, Hans-Ulrich; and Klatte, Hans-Jurgen, to Klockner-Humboldt-Deutz Aktiengesellschaft. Liquid cooled reciprocable piston internal combustion engine. 3,744,462, Cl. 123-41.310.

Herunter, Franz, to AMF Incorporated. Ski boot or inner shoe for a ski boot. 3,744,161, Cl. 36-2.5al.

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Hess, Louise, to Wilhelm Volhmar Bonner Wachebleiche und Wachswarenfabrik. Wax candle manufacture. 3,744,956, Cl. 431-126.000.

Hessinger, William A., to Teledyne, Inc. Strain gage pressure transducer. 3,744,317, Cl. 73-398.0ar.

Hetzel, Max; and Waibel, Pierre, to Omega Louis Brandt et Freres, S.A. Motion transformer. 3,744,326, Cl. 74-128.000.

Hetzel, Max, to Omega Louis Brandt et Freres, S.A. Motion transformer. 3,744,327, Cl. 74-128.000.

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Hightower, Cooper. Golf practice device. 3,744,799, Cl. 273-183.00r.

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Hill, James C. Fluid pilot valve. 3,744,523, Cl. 137-625.680.

Hilsum, Cyril; and Rees, Huw David, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defense in Her Britannic Majesty's Government of the. Semiconductor device of P-type alloys. 3,745,427, Cl. 317-235.00r.

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Hiratsuka, Michio; Ishii, Jiro; Hiwatashi, Koshi; Mizoguchi, Toshiaki; Ogata, Yoshikazu; Ono, Makoto; and Goto, Yoshiyuki, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Toroidal magnetoelastic transducer for measuring mechanical forces. 3,745,448, Cl. 324-4.00r.
Hirs, Gilles Gerardus, to Nederlandse Organisatie voor Toegepast. Method and a device for determining the temperature at viscosity measurements. 3,744,315, Cl. 73-344.000.
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Holland, John G., Sr., to Rolligon Corporation. Vehicle having axial supporting wheels engageable with load bearing driving rollers. 3,744,585, Cl. 180-74.000.
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Hong, Se J.; and Patel, Arvind M., to International Business Machines Corporation. Shift register error correcting system. 3,745,526, Cl. 340-146.1al.
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Jacobs, Stanley C., to Aluminum Company of America. Protected electrode lead for use in a corrosive environment. 3,745,107, Cl. 204-243.00r.
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Jacobsson, Jan Roland, to AGA Aktiebolag. Apparatus for correlation spectroscopy. 3,744,918, Cl. 356-188.000.

Jacquot, Michel; and Amicel, Charles, to Boussois Souchon Neuvesel. Apparatus for the fabrication of an insulating pane unit. 3,744,697, Cl. 228-5.000.

Jaggers, Brian G.: *See—*
Curtis, Anthony J.; Janes, John F.; and Jaggers, Brian G., 3,745,131.

Jaguar Cars Limited: *See—*
Wright, Frank, 3,745,419.

Jakob, Gert: *See—*
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James, Alfred, III: *See—*
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Jamison, Will B., to Consolidation Coal Company. Apparatus for maintaining detecting devices free of contaminants. 3,744,873, Cl. 350-63.000.

Janes, John F.: *See—*
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Jansen, Wilhelm: *See—*
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Janssens, Wilhelmus; and Van Den Bergh, Armand Maria, to Agfa-Gevaert N.V. Photographic element comprising ultraviolet-absorbing polymers. 3,745,010, Cl. 96-84.00r.

Japanese Geon Company, Ltd., The: *See—*
Go, Tadahiro; Usui, Tatuo; and Kaitu, Toshiko, 3,745,132.

Jarrett, David Michael: *See—*
Jarritt, Percival Ward; and Jarrett, David Michael, 3,744,384.

Jarritt, Percival Ward; and Jarrett, David Michael, to Masson Scott Thrissell Engineering Limited. Rollers for cutting, creasing, perforating or embossing sheet materials. 3,744,384, Cl. 93-58.20r.

Jarvis Corporation: *See—*
Chamberlain, Harold F., 3,744,750.

Jaster, Dale R.; and Quigley, James R., to GTE Automatic Electric Laboratories, Incorporated. Contactless test apparatus for determining the sensitivity of reed switches. 3,745,447, Cl. 324-28.0rs.

Jazbutis, Anatolijus: *See—*
Martin, Afton V.; Moldovan, Michael T.; Jazbutis, Anatolijus; Fourgere, Guy L.; Rising, Donald B.; Koger, Gary C.; Arciprete, Genio R.; and Svendsen, Noel, 3,744,713.

Jeffs, Keith Derek, to Metal Box Company Limited, The. Polyolefins film material. 3,745,038, Cl. 117-47.00a.

Jelier, Cornelis Adrianus: *See—*
Huisman, Peter Hendrik; and Jelier, Cornelis Adrianus, 3,744,774.

Jelinek Robert M., to Ceco Corporation, The. Storage rack restraining assemblies. 3,744,647, Cl. 211-175.000.

Jen, Timothy Yu-Wen; and Loev, Bernard, to Smith Kline & French Laboratories, Inc. Compositions and methods for producing hypotensive activity with imidazo and pyrimido (2,1-b) quinazoline compounds. 3,745,216, Cl. 424-251.000.

Jeney, A. Frank: *See—*
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Jenkins, Albert William. Casters. 3,744,083, Cl. 16-26.000.

Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., to Eastman Kodak Company. Photographic elements and light-absorbing layer. 3,745,009, Cl. 96-84.00r.

Jenkins, Weston H., to Corning Glass Works. Apparatus and method for forming spheres from molten fusible material. 3,744,983, Cl. 65-21.000.

Jennings, Arthur F., to Eastern Rotorcraft Corporation. Control for cable reel. 3,744,759, Cl. 254-150.00r.

Jensen, Arne A., 20% to Hollister, Roger A. Gun cartridge holder. 3,744,170, Cl. 42-87.000.

Jensen, Warren, to Atco Enterprises. Lawn mower apparatus. 3,744,223, Cl. 56-10.200.

Jensen, William S., to Turf-Vac Corporation. Lift dump vacuum apparatus. 3,744,653, Cl. 214-50.000.

Jepperson, Richard M.; and Simmonds, C. Warren, to Crane Products Manufacturing Co., Inc. Proximity alarm. 3,745,549, Cl. 340-258.00c.

Jernigan, James L.; and O'Neill, Thomas H., Jr., to United States of America, Navy. Bragg angle collinear heterodyning filter. 3,745,353, Cl. 250-216.000.

John Disenbery Company, Inc.: *See—*
Burnage, David, 3,744,730.

Johnson, Donald L. Log flacing and parting apparatus. 3,744,539, Cl. 144-176.000.

Johnson, Erlon Fitch; Gerber, Jay Calvin; and Crabb, Donald Eugene, to AMP Incorporated. Multiple contact connector. 3,745,512, Cl. 339-59.00m.

Johnson, Ernest D.: *See—*
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Johnson, Ernest H.; and Ricker, Conrad J., to Andrew Corporation. Coaxial cable resistant to high-pressure gas flow. 3,745,232, Cl. 174-107.000.

Johnson, Leonard W.; and Newton, Albert E., to USM Corporation. Weatherstrip. 3,745,053, Cl. 161-63.000.

Johnson, Mark S. Method of securing prolapsed vagina in cattle. 3,744,495, Cl. 128-337.000.

Johnson, Owen: *See—*
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Johnson, Peter D., to United States of America, Navy, mesne. Optical radiation detector. 3,745,566, Cl. 343-5.00r.

Johnson, Robert W., to Control Data Corporation. Pulse driver circuit. 3,745,377, Cl. 307-252.00j.

Johnston, Earl W. Compactly folding sled. 3,744,811, Cl. 280-12.00k.

Johnston, Harlin D.: *See—*
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Jonason, Arne Holger; and Granlund, Gosta Holger, to Saab-Scania Aktiebolag. Arrangement for measuring the speed of a vehicle in a brake control system of the vehicle. 3,744,849, Cl. 303-21.0be.

Jones, Cecil R., to Transfer Systems Incorporated. Elevator for a reactor well and equipment storage area. 3,744,593, Cl. 187-17.000.

Jones, Charles E.; and Aiken, William Ross, to Display Technology Corporation. Arrangement for preserving the free rotatability of the individual vanes in composite display devices. 3,745,563, Cl. 340-378.000.

Jones, Frank T.: *See—*
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Jones, Hale M.; and Deas, Richmon E., to Ampex Corporation. Precision ramp generator with precise steady state output. 3,745,373, Cl. 307-228.000.

Jones, John W., to Lockheed Aircraft Corporation. Thermit composition and method of making. 3,745,077, Cl. 149-40.000.

Jonsson, Rune, to Saab-Scania Aktiebolag. Automatic contrast sign selector for video tracking. 3,745,244, Cl. 178-6.800.

Jorda, Jose Mas; Farre, Jacinto Fort; and Espinosa, Francisco Gutierrez, to Netlon (P.T.A.) Limited. Extruded plastics netting. 3,744,529, Cl. 138-125.000.

Joseph, Thomas A.; Leiter, Earl P.; and Lhota, Harold P., to Republic Steel Corporation. Unitary locker door latch. 3,744,831, Cl. 292-81.000.

Joubert, Raymond Jean Maurice: *See—*
Bouiller, Jean Georges; Joubert, Raymond Jean Maurice; Lacroix, Armand Jean-Baptiste; and Bauer, Louis Jules, deceased, 3,744,861.

Joyce, William B., to Industrial Nucleonics Corporation. Volumetric measuring method and apparatus. 3,745,338, Cl. 250-435.0fl.

Juchheim, Moritz K.: *See—*
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Juchheim, Peter; and Konig, Joachim, to Juchheim, Moritz K. Seating for the screw spindle and guide means for the sliding contact wire in a glass tube thermometer of round, non-circular or polygonal cross section and containing adjustable electrical contct means for temperature. 3,745,501, Cl. 337-122.000.

Julius Goldman's Egg City: *See—*
Maxwell, Bert F.; Price, Donald A.; and Price, Harold A., 3,744,145.

Jumentier, Claude; and Bonnet, Alain, to Compagnie de Saint-Gobain. Heat insulating fibrous mass. 3,745,060, Cl. 161-170.000.

Juncker, Arnold A. Chain saw sharpener. 3,744,349, Cl. 76-25.00a.

June, Ronald K., to Shell Oil Company. Sulfur slurry preparation in pipelines. 3,745,122, Cl. 252-309.000.

Jungesjo, Harald N.: *See—*
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Jungkind, Roland, to Marker, Hannes. Toe iron safety ski bindings. 3,744,810, Cl. 280-11.35t.

Jurd, Leonard; and King, Alfred Douglas, Jr., to United States of America, Agriculture. Preservation process using 2-(4-hydroxyphenyl)-benzofuran. 3,745,218, Cl. 424-285.000.

Jurd, Leonard; King, A. Douglas, Jr.; and Stanley, William L., to United States of America, Agriculture. Cinnamyl phenols useful as antimicrobial agents. 3,745,222, Cl. 424-346.000.

Jurisch, Wilhelm: *See—*
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Justice, James W. H., to Westinghouse Electric Corporation. Multiplex TV system for transmitting and receiving a plurality of pictures on a line sharing basis. 3,745,242, Cl. 178-6.000.

Juvonen, Heino: *See—*
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Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See*—
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Kachur, Victor; and Toeniskoetter, Richard E., to Ashland Oil Inc. Foundry processes and products. 3,745,139, Cl. 260-38.000.

Kahler, Ronald D. Apparatus for testing alternators and voltage regulators. 3,745,456, Cl. 324-73.00r.

Kaitu, Toshiko: *See*—
Go, Tadahiro; Usui, Tatuo; and Kaitu, Toshiko, 3,745,132.

Kakumu, Ichizo; and Ito, Teruyuki, to Toyoda Kokisha Kabushiki. Automatic adjusting apparatus for front cover of grinding wheel guard and coolant nozzle. 3,744,189, Cl. 51-267.000.

Kalippke, Harold: *See*—
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Kalish, Herbert S., to Adamas Carbide Corporation. Method of forming a hard surface on cemented carbides and resulting article. 3,744,979, Cl. 29-182.200.

Kalverboer, Cornelis, to Aktiengesellschaft Brown, Boveri & Cie. Method of and apparatus for testing monitoring organs in a turbine installation. 3,744,311, Cl. 73-168.000.

Kalvitz, Paul V.: *See*—
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Kaman Aerospace Corporation: *See*—
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Kamijo, Noriyuki, to Kubushiki Kaisha Suwa Seikosha. Electronic timepiece with positionable rotor. 3,744,234, Cl. 58-34.000.

Kamlet, Mortimer J.: *See*—
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Kanai, Kenji: *See*—
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Kaneko Company: *See*—
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Kanow, Willy: *See*—
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Kaplan, Benjamin B., to Albi Manufacturing Corporation. Insulating composition. 3,745,031, Cl. 106-15.0fp.

Kaplan, Lloyd A.: *See*—
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Kaplow, Milton; and Halik, Joseph J., to General Foods Corporation. Immersion cooking in a stabilizing solution comprising polyhydric alcohol. 3,745,027, Cl. 99-199.000.

Karato, Yoshiteru, to Shiba Electric Co., Ltd. Color television camera equipment. 3,745,236, Cl. 178-5.4st.

Karato, Yoshiteru, to Shiba Electric Co., Ltd. Color television camera equipment having a reference filter and a color filter assembly interposed between the camera and subject. 3,745,237, Cl. 178-5.4st.

Kardashian, Vahram S., to Honeywell Inc. Single source several sensor security system. 3,745,553, Cl. 340-276.000.

Karikomi, Masahiro; and Kataoka, Yoshio, to Nippon Telegraph and Telephone Public Corporation. Dual reflector antenna capable of steering radiated beams. 3,745,582, Cl. 343-758.000.

Karlsson, Ake Gustav-Adolph; and Svenning, Bengt Furchtegott Staffan, to Saab-Scania Aktiebolag. Joystick type control device with displacement feel. 3,744,335, Cl. 74-471.440.

Karnavas, James A.: *See*—
Pelczarski, Eugene A.; Larosa, Paul J.; and Karnavas, James A., 3,744,780.

Karnes, Donovan; and Centliver, Marion F., to Hobart Brothers Company. Apparatus for moving wire. 3,744,694, Cl. 226-168.000.

Kasano, Hiroyuki, to Hitachi, Ltd. Optical semiconductor device and method of manufacturing the same. 3,745,423, Cl. 317-234.00r.

Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for the polymerization or copolymerization of ethylene and catalyst compositions therefor. 3,745,154, Cl. 260-88.20r.

Kashiwagi, Shigeru, to Victor Company of Japan, Limited. High voltage producing circuit for television receivers. 3,745,246, Cl. 178-7.50r.

Kataoka, Yoshio: *See*—
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Katayama, Morio. Fixing washer of a decorative button for furniture. 3,744,100, Cl. 24-152.000.

Kato, Kinpei: *See*—
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Kato, Naoe. Method of hydroponic cultivation. 3,744,183, Cl. 47-1.200.

Katsumura, Tatsuo; Matsunaga, Tetsuya; Tahara, Tadasu; and Suzuki, Reiichi, to Nitto Chemical Industrial Co., Ltd. Process for producing alkyl tin halides. 3,745,183, Cl. 260-429.700.

Kauffman, John H.; and Donat, Ralph J., to National Engineering Co. Mixer system. 3,744,768, Cl. 259-154.000.

Kaufman, William M.; and Powell, Donald P., to Hiltman Associates, Inc. Dry contact electrode with amplifier for physiological signals. 3,744,482, Cl. 128-2.06e.

Kaugars, Girts, to Upjohn Company, The. Methods of combatting insects and mites using alkanoyl chloride phenylhydrazones. 3,745,215, Cl. 424-327.000.

Kawakami, Hirotake. Phonograph pickup cartridge. 3,745,263, Cl. 179-100.41k.

Kay, Richard B.; and Holland, Richard J. Optical device for transformation of polarization. 3,744,876, Cl. 350-157.000.

Kayama, Taichiro: *See*—
Ikeda, Kazunori; Arai, Takeo; Iwata, Kiyohisa; Kishida, Tsuneo; Yamamura, Takuo; and Kayama, Taichiro, 3,744,548.

Kaye, Gordon E., to Mallory, P. R., & Co., Inc. Electrically commutating battery cases. 3,745,049, Cl. 136-173.000.

Kee, Richard C.: *See*—
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Keienburg, Heinz; and Jansen, Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Change gear transmission for motor vehicles. 3,744,345, Cl. 74-745.000.

Kelby, Edward, Jr.; and Wallskog, Alan G., to Teletype Corporation. Rotary and linear magnetomotive positioning mechanism. 3,745,433, Cl. 318-115.000.

Kelli, John W. Fish-on-line signaling device. 3,744,172, Cl. 43-17.000.

Kelly, Donald A. Closed cycle rotary engine system. 3,744,245, Cl. 60-95.000.

Kelly, Thomas J.: *See*—
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Kelly, William D. Metal sheathed electrical wire cable. 3,745,230, Cl. 170-103.000.

Kelly, William N., to United States of America, Army. Angular deception jammer providing adjustable width pulses after adjustable time. 3,745,381, Cl. 307-215.000.

Kelsey-Hayes Company: *See*—
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Kemper, Kate. Kneading device. 3,744,769, Cl. 259-185.000.

Kendall Company, The: *See*—
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Kennecott Copper Corporation: *See*—
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Ker Shaw, Stuart Walter; and Fontaine, Paul Isidore, to International Nickel Company, Inc., The. Nickel base alloys of improved high temperature tensile ductility. 3,744,996, Cl. 75-122.500.

Kerker, Richard; and Wells, Otis D., to McDonnell Douglas Corporation. Liftvanes. 3,744,745, Cl. 244-41.000.

Kerner, Fred G. Portable fruit harvester. 3,744,227, Cl. 56-335.000.

Kerr, Bob C.: *See*—
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Kersting, Raymond J.: *See*—
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Kessler, Harold D.: *See*—
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Keyser, Lewis R., to Price Brothers Company. Pipe joint seal. 3,744,806, Cl. 277-152.000.

Kezer, Thatcher W. Carrier device for wheeled vehicles. 3,744,688, Cl. 224-32.00r.

Khattab, Ghazi; and Stoloff, Alfred, to Allied Chemical Corporation. Stabilized melt-processable ethylene/chlorotrifluoroethylene copolymer compositions. 3,745,145, Cl. 260-45.75x.

Kick, Hermann: *See*—
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Kida, Kazuyoshi: *See*—
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Kiemle, Horst; and Wolff, Ulrich, to Siemens Aktiengesellschaft. Liquid crystal matrix with contrast enhancement. 3,744,878, Cl. 350-160.0lc.

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Kikuchi, Hideyuki, to Kikuchi Natural and Applied Science Research Laboratory. Method of detecting subsurface objects. 3,745,575, Cl. 343-12.00r.

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Kille, Charles Alden: *See*—
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Kilpartick, David D. Circular segmented sighting mechanism. 3,744,143, Cl. 33-233.000.

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King, A. Douglas, Jr.: *See*—
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King, Alfred Douglas, Jr.: *See*—
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King, Wayne Jay, to Pacific Micronetics, Inc. Suspension and mounting of transducer heads using resilent spacers to position head. 3,745,543, Cl. 340-174.10e.

Kinoshita, Haruo, to Yamaha Hatsudoki Kabushiki Kaisha. Reciprocating piston type engines having weight for balancing primary inertial forces. 3,744,342, Cl. 74-604.000.

Kirte, Willard H.: *See—*
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Kishida, Motoki, to Kabushiki Kaisha Suwa Seikosha. Time-piece of improved readability in darkness. 3,744,236, Cl. 58-50.00a.

Kishida, Tsuneo: *See—*
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Kitajima, Kenichi; Nagano, Akira; and Mitsui, Masatoshi. Apparatus for controlling clock pulses. 3,745,380, Cl. 307-260.000.

Kjar, Raymond A., to North American Rockwell Corporation. Charge circuit for field effect transistor logic gate. 3,745,370, Cl. 307-205.000.

Klatte, Hans-Jurgen: *See—*
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Klehm, William G., Jr., to Burroughs Corporation. High speed serial scan and read-out of keyboard. 3,745,536, Cl. 340-172.500.

Klein, Adolph H.; and Hoyt, John D., to United States of America, Navy. Small craft positioning system. 3,745,519, Cl. 340-3.00e.

Klein, Gerrit; and Elbert, Karel, to U.S. Philips Corporation. Mixer circuit. 3,745,473, Cl. 328-133.000.

Klein, Heinrich, to Siemens Aktiengesellschaft. Device for imparting a twist to a flow of raw gas in a tornado flow separator. 3,744,220, Cl. 55-261.000.

Klein, Theodore J., to United States of America, Army. Coded equalizer. 3,745,463, Cl. 325-42.000.

Klein, Thomas: *See—*
Beale, Julian Robert Anthony; Beer, Andrew Francis; Klein, Thomas; and Murphy, Nigel Malcolm St. John, 3,745,425.

Kleiner, Edward K., to Ciba-Geigy Corporation. Stabilized organic compositions containing hindered phenolic thiosuccinates. 3,745,147, Cl. 260-45.85s.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
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Knowles, Richard N.: *See—*
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Kobayashi, Seihin; Torii, Michihiro; and Jojima, Takehiko, to Fuji Electrochemical Co., Ltd. Magnetic thin film plated wire memory. 3,745,541, Cl. 340-174.0pw.

Kobayashi, Tunekazu, to Denki Onkyo Co., Ltd. Galvano-magnetro effect apparatus. 3,745,503, Cl. 338-12.000.

Kobe Steel, Limited: *See—*
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Koch, H., & Sons, Inc.: *See—*
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Gaylord, John A., 3,744,103.

Koch, Heinrich. Device for regenerating foil webs or foil strips into a granulate. 3,744,727, Cl. 241-93.000.

Koechlin, Paul, to UNELEC. Spacer for the windings of an electrical machine. 3,745,395, Cl. 310-260.000.

Koehler, William F. Elongated rigidified container. 3,744,659, Cl. 217-7.000.

Koehring Company: *See—*
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Koenig, Alfred. Adjustable support for bobbins. 3,744,735, Cl. 242-130.000.

Koerner, Ernest C.; Hall, Ralph W.; Hilker, George D.; and Wareham, William W., to Phelps Dodge Magnet Wire Corporation. Bonding composition containing a blocked isocyanate. 3,745,138, Cl. 260-33.4ur.

Koger, Gary C.: *See—*
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Koike, Hirotami, to Nihon Denshi Kabushiki Kaisha. Apparatus for separating charged particles according to their respective ranges. 3,745,337, Cl. 250-41.9tf.

Koike, Kouichi: *See—*
Yunde, Yasufumi; Yanaka, Shigenobu; and Koike, Kouichi, 3,745,245.

Koizumi, Yutaka, to Kabushiki Kaisha Ricoh. Developing device of the magnetic brush type for electrophotographic apparatus using a dry developer. 3,744,451, Cl. 118-637.000.

Kok, Albertus Jacobus Theodorus, to IPP Industrial Polymer Processing S.A. Binder. 3,744,096, Cl. 24-16.0pb.

Kolath, William: *See—*
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Krause, Wilbur. Caulking clean-up tool. 3,744,079, Cl. 15-235.700.

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Kruhn, Jurgen, to Licentia Patent-Vervaltungs G.m.b.H. Recording and/or playback device having tape-type record carriers which are wound on a reel. 3,744,736, Cl. 242-195.000.

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Kulesz, James J. Method and apparatus for measuring ultra-low gas pressures. 3,744,318, Cl. 73-399.000.
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Campbell, Laurie J.; Lohr, Raymond J.; and Kienholz, Charles M., 3,744,800.
Loichinger, Fred A., to Stoelting Brothers Company. Support for knife assembly in cheese processing equipment. 3,744,405, Cl. 31-48.000.
Longley, Charles S.: *See—*
Thomas, Edward V.; and Longley, Charles S., 3,744,782.
Loprest, Frank J.; and Barr, Donald E., to GAF Corporation. Transparent photographic masks. 3,744,904, Cl. 355-125.000.
Lorain Products Corporation: *See—*
Brown, Harold J., 3,745,437.
Lorch, Hugh Olaf, to English Electric Company Limited, The. Supercooled dynamo electric machines. 3,745,389, Cl. 310-52.000.

Lord, Harold Wilbur, to Litton Systems, Inc. Electrical inverter-rectifier circuit and inductor apparatus therefor. 3,745,440, Cl. 321-26.000.

L'Oreal: *See—*
Morane, Bruno P., 3,744,681.

Loricchio, Domingos, to Carborundum Company, The. Additives for controlling the physical and structural characteristics of cast iron. 3,744,998, Cl. 75-130.00r.

Lott, Lauren R., to United States of America, Navy. Double mixing doppler simulator. 3,745,579, Cl. 343-17.700.

Lovejoy, Curtis N.: *See—*
Kosowsky, Leo N.; Lovejoy, Curtis N.; Cunniff, John G.; and Groom, Robert T., 3,745,105.

Lowell, Francis C.: *See—*
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Lowery, Dennis J.; and Merchant, Robert E., to Dixson, Inc. Lighting unit arrangements for needed and/or decorative lighting using definite forms such as light blocks. 3,745,327, Cl. 240-9.00r.

Lown, Ellsworth H., 1/2 to Charles, Alfred. Apparatus for sensing combustible gases of differing densities. 3,744,289, Cl. 73-23.000.

Lucas, Joseph, (Industries) Limited: *See—*
Freeman, Frank George, 3,744,379.
Harrold, Maurice, 3,744,748.
Mosby, Geoffrey Ralph, 3,745,272.
Phoenix, Lancelot; and Walpole, David Valentine, 3,745,392.
Soltau, John Peter, 3,744,464.
Wilkinson, Norman, 3,745,278.
Wright, Maurice James, 3,745,453.

Lucci, Roberto; and Orlandini, Paolo, to S.p.A. VELCA. Portable, folding stepladder. 3,744,591, Cl. 182-156.000.

Luce, Carl T.: *See—*
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Luceri, Joseph A. Reversible necktie and method for making same. 3,744,057, Cl. 2-146.000.

Lucerne Products, Inc.: *See—*
Sahrbacker, Edward V., 3,745,286.

Lucero, Frank J. Cable laying apparatus with off-center inclined earth-penetrating blade. 3,744,260, Cl. 61-72.600.

Lummus Company, The: *See—*
Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 3,745,193.

Lummus Industries, Inc.: *See—*
Van Doorn, Donald W.; and Hawkins, James B., 3,744,361.

Lund, Robert N. Fish lure. 3,744,174, Cl. 43-42.060.

Lundahl, Ezra C., Inc.: *See—*
Lundahl, Ezra Cordell, 3,744,228.

Lundahl, Ezra Cordell, to Lundahl, Ezra C., Inc. Compacting system for stacking bulk hay. 3,744,228, Cl. 56-344.000.

Lundquist, Richard E.; and Kerr, William J., to Motorola, Inc. Thick film feed-through capacitor. 3,745,430, Cl. 317-256.000.

Lundquist, Robert L.; and Mathey, Charles J., to Motorola, Inc. Multiband radio receiver. 3,745,467, Cl. 325-304.000.

Lundquist, Sven Anders, to Boliden Aktiebolag. Method for converting copper. 3,744,992, Cl. 75-76.000.

Lundsgart, Henning Borge, to Dansk Industri Syndikat A/S. Machine for producing moulds consisting of identical mould parts. 3,744,552, Cl. 164-187.000.

Lutze, Walter: *See—*
Burckhardt, Manfred H.; Lutze, Walter; and Schwerdt, Paul, 3,745,390.

Lynah, Francis P., Jr.; and Leonard, Morton J., Jr., to Hoffman, P. R., Company. Planetary lapping machine abrading plates. 3,744,187, Cl. 51-118.000.

M & T Chemicals Inc.: *See—*
Baum, Gerald A.; and Considine, William J., 3,745,219.
Chessin, Hyman; and Walker, Paul D., 3,745,097.

Mabuchi, Kenichi, to Mabuchi Motor Co., Ltd. Propeller drive mechanism for a model airplane. 3,744,180, Cl. 46-78.000.

Mabuchi Motor Co., Ltd.: *See—*
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Mack, Michael E., to United Aircraft Corporation. Light amplification using absorbing medium. 3,745,476, Cl. 330-4.300.

Mackay, Byron R. Silver recovery. 3,744,995, Cl. 75-109.000.

MacNair, Richard N.: *See—*
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MacNiel, Douglas K., to U.S. Divers Co. Reserve and fill valve for self-contained underwater breathing apparatus. 3,744,526, Cl. 137-599.200.

Maddocks, Gerald E., to Fram Corporation. Pressure operated temperature sensor actuator. 3,744,715, Cl. 236-13.000.

Maddox, Wayne L.; Coleman, Robert L.; and Shults, Wilbur D., II, to United States of America, Atomic Energy Commission. Loading disk for photometric analyzer of rotary cuvette type. 3,744,974, Cl. 23-259.000.

Madigan, Paul Mylett: *See—*
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Maemori, Kenichi: *See—*
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Magleave, James Edward; and Rushton, Harold, to British Legland Tank and Bus Division Limited. Motor vehicle suspension. 3,744,813, Cl. 280-124.00r.

Magni, Reinald G., to Crane Co. Cooling systems for motor driven pumps and the like. 3,744,935, Cl. 417-370.000.

Magnuson, Genevieve I.: *See—*
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Magnuson, Robert: *See—*
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Mahlman, Bert H., to Hercules Incorporated. Process for preparing highly filled polyolefins. 3,745,142, Cl. 260-41.00r.

Mailander, J. G.: *See—*
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Mailen, James C., to United States of America, Atomic Energy Commission. Rotor for multistation photometric analyzer. 3,744,975, Cl. 23-259.000.

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Makhover, Jury Meerovich: *See—*
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Malarkey, Terence D.: *See—*
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Malenka, John F. Boat fender or bumper. 3,744,445, Cl. 114-219.000.

Malesh, Allan D., to Abet Industries Corporation. Frequency generator for electrical discharge machining. 3,745,298, Cl. 219-69.00c.

Mallinckrodt Chemical Works: *See—*
Brown, James L.; and Hallett, Floyd P., 3,745,211.

Mallon, Marvin C., to Interdyne Company. Printed circuit board/integrated circuit socket combination. 3,745,510, Cl. 339-17.00r.

Mallory, P. R., & Co., Inc.: *See—*
Kaye, Gordon E., 3,745,049.

Malloy, Glenn T.: *See—*
Bovenkert, Harold P.; and Malloy, Glenn T., 3,744,982.

Manes, Libero G. Nail clipper with receiver for nail clippings. 3,744,131, Cl. 30-28.000.

Mangood Corporation: *See—*
Tonies, Lawrence A., 3,745,335.

Manion, Francis M.: *See—*
Drzewiecki, Tadeusz M.; and Manion, Francis M., 3,744,303.

Maranchak, Vasily Makarovich; Novella, Vladimir Nikolaevich; and Petrovich, Stanislav. Method of protection of D.C. transmission lines and a device for accomplishing same. 3,745,417, Cl. 317-31.000.

Marathon Oil Company: *See—*
Allred, Victor D., 3,745,110.

Marciuliano, Frank, 51% to Ivy Graphics & Planning, Inc. Cigarette filter. 3,744,497, Cl. 131-261.00b.

Margolies, Arthur: *See—*
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Margosian, Paul M.; and Nakanishi, Shigeo, to United States of America, National Aeronautics and Space Administration. Single grid accelerator for an ion thrustor. 3,744,247, Cl. 60-202.000.

Mariani, Brunello; and Sgarbi, Renato, to Ferrania, S.p.A. Cyanine dyes. 3,745,157, Cl. 260-240.100.

Mark Products, Inc.: *See—*
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Marker, Hannes: *See—*
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Marranci, Giulio; Bianchi, Gerardo; and Barbon, Alessandro, to Societa Italiana Resine S.P.A. Composition and method for dispersing oily and tarry residues on surfaces. 3,745,125, Cl. 252-312.000.

Marsan, Mario S., to Procter & Gamble Company, The. Disposable diaper with improved containment characteristics. 3,744,494, Cl. 128-287.000.

Marsh, Francis. Sintering machines. 3,744,777, Cl. 263-28.000.

Marshall, Alfred G. Vacuum cleaner and rake. 3,744,082, Cl. 15-402.000.

Marshall, George L., to Central Tool Co., Inc. Timing gage. 3,744,142, Cl. 33-181.0at.

Marshall, Winston S., to Lilly, Eli, and Company. Anti-inflammatory agents. 3,745,223, Cl. 424-353.000.

Martell, George E.: *See—*
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Martin, Afton V.; Moldovan, Michael T.; Jazbutis, Anatolijus; Fourgere, Guy L.; Rising, Donald B.; Koger, Gary C.; Arciprete, Genio R.; and Svendsen, Noel, to AVM Corporation, mesne. Voting machine. 3,744,713, Cl. 235-54.00f.

Martin, Donald L., Jr.: *See—*
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Martin, Fred David: *See—*
Szabo, Miklos Tamas; Boothe, Jerry Emile; Sharpe, Andrew Jackson, Jr.; and Martin, Fred David, 3,744,566.

Martin, Godfrey Q.; and Ralph, James L., to Shell Oil Company. Sulfur slurry preparation and transportation in pipelines. 3,745,123, Cl. 252-309.000.

Martin, Harold B.; and Rogg, Herman O., to Graber-Rogg Inc. Foot pedal. 3,744,341, Cl. 74-561.000.

Martin, Harold B.; and Rogg, Herman O., to Graber-Rogg, Inc. Chord organs. 3,744,364, Cl. 84-360.000.

Martinson, Arne I. Adjustable cable stop. 3,744,339, Cl. 74-501.00r.

Martone, Ronald J., to Picker Corporation. Scintillation crystal with reflection inhibiting material and scintillation device embodying the crystal. 3,745,359, Cl. 250-71.50r.

Marushima, Giichi: *See—*
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Marx, Louis, & Co., Inc., mesne: *See—*
Campbell, Laurie J.; Lohr, Raymond J.; and Kienholz, Charles M., 3,744,800.

Maryland Cup Corporation: *See—*
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Marziano, Samuel J.; and Revell, John, to United States of America, Army. Thermite cable cutter. 3,744,369, Cl. 89-1.00b.

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Mason, Lowell M., to General Electric Company. Electrical insulators for slotted magnetic cores. 3,745,394, Cl. 310-215.000.

Massey, Roger G., to Parker & Harper Mfg. Co., Inc., The. Detachable handle for control devices. 3,744,752, Cl. 251-292.000.

Masson Scott Thrissell Engineering Limited: *See—*
Jarritt, Percival Ward; and Jarrett, David Michael, 3,744,384.
Parker, David George; and Jackson, Donald Richard Patrick, 3,744,788.

Mathey, Charles J.: *See—*
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Mathias, Benny B.; and Sager, James R., to Owens-Illinois, Inc. Cavity identification. 3,745,314, Cl. 235-61.11e.

Matsunaga, Tetsuya: *See—*
Katsumura, Tatsuo; Matsunaga, Tetsuya; Tahara, Tadasu; and Suzuki, Reiichi, 3,745,183.

Matsushita Electric Industrial Co., Ltd.: *See—*
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Ishida, Tumio; Sato, Kunio; Sugihara, Kanji; and Yoshida, Shigeru, 3,745,507.
Nakajima, Yasuo; Nagata, Takashi; Hagiwara, Kiyokazu; and Sasaki, Reiichi, 3,745,385.
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Matsushita Electric Industrial Company, Limited: *See—*
Tomki, Tetsuhiko; and Miyata, Takeo, 3,744,870.

Matt, Robert E.; and Levy, Alan V., to Aerojet-General Corporation. Powder metallurgy process. 3,744,993, Cl. 75-213.000.

Mattel, Inc.: *See—*
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Mattern, John, to Westinghouse Electric Corporation. Analog to digital converter. 3,745,559, Cl. 340-347.0ad.

Matthews, Charles William: *See—*
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Matvey, Alexander. Alternating vane type rotary engine with planetary gear system. 3,744,938, Cl. 418-18.000.

Mauthe, Gerhard: *See—*
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Max, Jacques: *See—*
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Maxant Button & Supply Co.: *See—*
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Maxwell, Bert F.; Price, Donald A.; and Price, Harold A., to Julius Goldman's Egg City. Organic waste dryer apparatus. 3,744,145, Cl. 263-68.000.

Maynard, Derek J.: *See—*
Cuintal, Bertram S.; and Maynard, Derek J., 3,745,396.

Mayo, Kenneth E.: *See—*
Parker, Eugene K.; Mayo, Kenneth E.; and Harvey, Douglas G., 3,744,053.

Mayr, Anton J.; and Baum, Sidney J., to Foster Grant Co., Inc. Apparatus for stretching plastic sheet material. 3,744,106, Cl. 26-54.000.

Maytag Company, The: *See—*
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Mc Dermott, John M.: *See—*
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Mc Farland, James D., Jr., to Edelbrock Equipment Company. Intake manifold for internal combustion engines having a sudden enlargement in the flow path of each runner. 3,744,463, Cl. 123-52.0mv.

McCampbell, Carroll B., Jr.: *See—*
Haertling, Gene H.; and McCampbell, Carroll B., Jr., 3,744,875.

McCarthy, Denis L.; and D'Albert, Joseph. Portable viewer for for fighting apparatus. 3,744,874, Cl. 350-96.00b.

McCartney, Edward O., to Maytag Company, The. Supporting system for centrifugal extractor. 3,744,710, Cl. 233-24.000.

McCarty, Stuart W.; Owen, Donald T.; and Owens, William F., Jr., to Olin Corporation. Carbon filled wrapper for smoking article. 3,744,496, Cl. 131-8.000.

McClary, Joseph M.; Lemkin, Jack Lewis; and Donaldson, Asa Lynn, to General Mills Fun Group, Inc. Sound mechanism for a balance device. 3,744,792, Cl. 273-1.00r.

McCormick, James Benjamin, to Miles Laboratories, Inc. Biological reaction chamber apparatus. 3,745,091, Cl. 195-139.000.

McCoy, Horace S. Safety pin. 3,744,099, Cl. 24-156.00r.

McCulloch Corporation: *See—*
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McCullough, Lester E.: *See—*
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McDonnell Douglas Corporation: *See—*
Kerker, Richard; and Wells, Otis D., 3,744,745.

McDowell-Wellman Engineering Company: *See—*
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McFadden, Charles A.: *See—*
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McFarland, Larry C., to United States of America, Army. Selective dual feed mechanism. 3,744,371, Cl. 89-33.0sf.

McGill, Howard L. Retrievable well packer apparatus. 3,744,563, Cl. 166-139.000.

McIntosh, Alexander C., to Tel-Tone Corporation. Frequency selective circuit including a twin-t notch filter. 3,745,376, Cl. 317-233.000.

McKee, Leonard B.: *See—*
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McKeown, John C.: *See—*
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McLean, Benjamin F. Hot box locaters with circulating fluid system. 3,745,333, Cl. 246-169.00d.

McLeod, Norman William, to Commonwealth of Australia, The. Control of operation of a system. 3,745,418, Cl. 317-40.00a.

McPherson, James H., to Cartridge Actuated Devices, Inc. Circuit breaking device. 3,745,276, Cl. 200-61.080.

McShan, Clarence H. Electroacoustic surface wave timing system. 3,745,485, Cl. 331-107.00a.

McTaggart, John A.: *See—*
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McWhorter, Daniel M.; and Taylor, Glenn N., to Kendall Company, The. Artificial sphincter for controlling urinary incontinence. 3,744,063, Cl. 3-1.000.

Medenus, Bernhard: *See—*
Herschmann, Otto; Mettig, Hermann; Medenus, Bernhard; Howe, Hans-Ulrich; and Klatte, Hans-Jurgen, 3,744,462.

Mee, Jack E.; Besser, Paul J.; Pulliam, George R.; Heinz, David M.; and Elkins, Perry E., to North American Rockwell Corporation. Method for producing bubble domains in magnetic film-substrate structures. 3,745,046, Cl. 117-235.000.

Mee, John D.: *See—*
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Meek, John S.; and Nelson, J. Roy. Educational toy. 3,744,151, Cl. 35-19.00r.

Mehltretter, Charles L.; and Weakley, Francis B., to United States of America, Agriculture. Active water-insoluble enzymers. 3,745,088, Cl. 195-63.000.

Meisei Electric Co., Ltd.: *See—*
Usizima, Syozi; Ohara, Sigeo; and Unno, Hirosi, 3,745,399.

Mellen, Alice Marian: *See—*
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Mellen, William F., to Mellen, Alice Marian. Roll over plow. 3,744,573, Cl. 172-225.000.

Mellin, Robert C., to General Motors Corporation. Swirling flow muffler. 3,744,589, Cl. 181-58.000.

Melsom, Gordon Thomas, to Dunlop Holdings Limited. Swaging tools. 3,744,114, Cl. 29-237.000.

Merchant, Robert E.: *See—*
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Mercier, Jacques H. Pulse damper unit for hydraulic system. 3,744,527, Cl. 138-30.000.

Merck & Co., Inc.: *See—*
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Mernyk, Edwin H. Frictionless spring suspension system. 3,744,783, Cl. 267-136.000.

Merritt, Richard F.; and Nichols, Richard W., to Rohm and Haas Company. 5-Alkoxy-5-chloromethyloxazolines. 3,745,168, Cl. 260-307.00f.

Messer, Ernst; and Singewald, Arno, to Wintershall Aktiengesellschaft. Apparatus for recovering underground deposits of soluble minerals. 3,744,847, Cl. 299-2.000.

Metaframe Corporation: *See—*
Willinger, Allan H.; and Dinnerstein, Albert J., 3,744,454.

Metal Box Company Limited, The: *See—*
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Metrailer, Charles E. Apparatus for modular concrete constructions. 3,744,945, Cl. 425-62.000.

Mettig, Hermann: *See—*
Herschmann, Otto; Mettig, Hermann; Medenus, Bernhard; Howe, Hans-Ulrich; and Klatte, Hans-Jurgen, 3,744,462.

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Meyer, Helmut: *See—*
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Meyer, Helmut P., to Bendix Corporation, The. Igniter plug. 3,745,400, Cl. 313-144.000.

Meyer, Larry P., to Nelson Irrigation Corporation, mesne. Sprinkler head with improved brake and bearing assembly. 3,744,720, Cl. 239-231.000.

M.F.C. Survival Limited: *See—*
Smith, Robert Leonard Masytn, 3,744,756.

Michaels, Leonard H., to Molex Incorporated. Tee connector for wiring harnesses. 3,745,515, Cl. 339-156.00r.

Michaels, Sid; and Darwin, Frank, to Strauss, Levi, & Co. Automatic bobbin changer. 3,744,442, Cl. 112-186.000.

Michelson, Anatol, to Gulf & Western Industrial Products Company. Unitary interchangeable tool module. 3,744,292, Cl. 72-354.000.

Middelhoek, Servaas, to N.V. Hollandse Metallurgische Industrie Billiton. Process for the preparation of vanadium (carbo) nitride. 3,745,209, Cl. 423-371.000.

Miki, Isao; and Ichikawa, Yuusuke, to Nippon Light Metal Company Limited. Oxygen flushing pressure die-casting method. 3,744,546, Cl. 164-55.000.

Mil Limited: *See—*
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Milan, Nicholas M. Height gauge. 3,744,137, Cl. 33-170.000.

Milard, Roland; and Hubert, Charles, to Thomson-CSF. Microwave phase-shift devices of the O-M type. 3,745,487, Cl. 333-31.00r.

Miles Laboratories, Inc.: *See—*
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Miller, Ann. Leaf collection container support. 3,744,081, Cl. 15-257.00t.

Miller, Donald L., to Bendix Corporation, The. Self-adjusting two-way electromagnetic disc clutch. 3,744,609, Cl. 192-111.00a.

Miller, Roger A.; and Colburn, Steven C., to General Dynamics Corporation. Low expansion, multi-band transmitting glass. 3,745,032, Cl. 106-47.00r.

Miller, Stanley J., to National Can Corporation. Die ring mounting and adjustment apparatus. 3,744,293, Cl. 72-467.000.

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Chai, Hi D.; Mills, Stephen H.; Pawletko, Joseph P.; Peters, Francis E.; and Young, Carl T., 3,745,495.

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Milwaukee Valve Company, Inc.: *See—*
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Miner, Hugh L.; Chana, Howard E.; and Thompson, Albert L., to General Motors Corporation. Transmission controlled power enrichment override apparatus. 3,744,346, Cl. 70-660.000.

Minnesota Mining and Manufacturing Company: *See—*
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Miranda, Ronald P.: *See—*
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Misawa, Yutaka; Ogawa, Takuzo; and Yagi, Hideyuki, to Hitachi, Ltd. Semiconductor device having a composite film as a passivating film. 3,745,428, Cl. 317-235.00r.

Misner, Donald E.: *See—*
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Miyashita, Kanji: *See—*
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Miyata, Takeo: *See—*
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Moefler & Neumann GmbH: *See—*
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Mojonnier, Albert B., Sr.: *See—*
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Molex Incorporated: *See—*
Michaels, Leonard H., 3,745,515.

Monash University: *See—*
Brown, Roger Frederick Challis; and Smith, Reginald James, 3,745,174.

Monne, Maxime; and Eudier, Michel. Chain conveyors. 3,744,618, Cl. 198-177.000.

Monnot, Max: *See—*
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Monpetit, Louis, to Societe des Procedes Modernes d'Injection Sopromi. Electronic fuel injecting system for internal combustion engines. 3,744,460, Cl. 123-32.0ea.

Monsanto Chemicals Limited: *See—*
Neale, Alan J.; and Rawlings, Terence J., 3,745,062.

Monsanto Company: *See—*
Blance, Robert B.; Cahill, David R.; and Wachtel, Peter, 3,745,006.
Munch, Ralph H.; and Thompson, Quentin E., 3,745,432.
Scott, Milton J.; Stevens, Harry M.; and Stenzel, Hans-Jurgen A., 3,744,999.

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Heenan, Sidney A.; Majewski, Norbert; and Montalbano, Anthony J., 3,744,117.

Montanari, Lucio; and Knirsch, Franco, to Olivetti, Ing., C., & C., S.p.A. Electro-thermic printing device. 3,744,611, Cl. 197-1.00r.

Montecatini Edison S.p.A.: *See—*
Ciaperoni, Aldenaro; Pontoglio, Enrico; and Cravini, Giovanni, 3,745,152.

Monti, Anthony: *See—*
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Mooney, John B., to Photophysics, Inc. Impregnated porous photoconductive device and method of manufacture. 3,745,504, Cl. 338-15.000.

Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Stable positively charged alumina coated silica sols. 3,745,126, Cl. 252-313.00s.

Moore, George L.: *See—*
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Moore, Richard E.: *See—*
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Moore, Roy N., to Murphy, G. W., Industries, Inc. Drill bit nozzles. 3,744,581, Cl. 175-340.000.

Moore, Thomas J.: *See—*
Holko, Kenneth H.; and Moore, Thomas J., 3,745,300.

Moradzadeh, Yaqub, to International Business Machines Corporation. Adjustment of color balance in electroporesis by modification of particle size. 3,745,003, Cl. 96-1.200.

Morales, Juan G.: *See—*
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Morane, Bruno P., to L'Oreal. Spout for dispensing fluids from pressurized containers. 3,744,681, Cl. 222-402.120.

Morat, Franz, GmbH, Firma: *See—*
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Morchand, Charles A.; and Dudley, Don J., to Data-Plex Systems, Inc. Television transmission methods and apparatus. 3,745,240, Cl. 178-5.600.

Moren, Robert A., to Plastofilm, Inc. Three component package having at least two components formed of vacuum molded plastic film. 3,744,663, Cl. 220-4.00d.

Morgan Construction Company: *See—*
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Mori, Takakazu: *See—*
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Morley, Carl H., to United States of America, Navy. Luminescent aerosol marker. 3,744,718, Cl. 239-8.000.

Morrfall, Albert F.: *See—*
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Morrison, Wilbur J., to Bell and Howell Company. Gripper jaw insert mistake detector. 3,744,787, Cl. 270-56.000.

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Morritt, Kenneth Patrick, to Morritt, K. P., Limited. Golfing equipment. 3,744,801, Cl. 273-208.000.

Morse, John B., to Polaroid Corporation. Adaptor for variable output photoflash apparatus. 3,745,323, Cl. 240-1.300.

Morstadt, Richard A., to GTE Automatic Electric Laboratories, Incorporated. Data guard circuit. 3,745,558, Cl. 340-347.0dd.

Mortenson, Wallis, to Container Corporation of America. Container. 3,744,703, Cl. 229-27.000.

Morton, John Fraser; Schlaffer, James C.; Eitzel, Robert J.; and Fowler, Joseph A., to Congoleum Industries, Inc. Resinous surface covering and process for producing same. 3,745,040, Cl. 117-76.0fb.

Mosby, Geoffrey Ralph, to Lucas, Joseph, (industries) Limited. Contact breaker assembly with improved adjustable distributor mounting plate and locking plate means. 3,745,272, Cl. 200-31.00a.

Moss, Charles W., to Tension Structures, Inc. Method of erecting prefabricated shelter. 3,744,205, Cl. 52-747.000.

Moteren-und Turbinen-Union Munich GmbH: *See—*
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Motorola, Inc.: *See—*
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Olah, Emery E., 3,744,323.
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Mott, James D., to Hydril Company. Subsurface well apparatus and method. 3,744,564, Cl. 166-224.000.

Mount, Alfred G., to Borg-Warner Corporation. Rotary sliding vane compressor with hydrostatic bearings. 3,744,942, Cl. 418-76.000.

Mozley, Richard Henry, to National Research Development Corporation. Reciprocating belt stratifier. 3,744,632, Cl. 209-433.000.

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Swidler, Ronald; Sanderson, William A.; Gamarra, Jose P.; and Mueller, William A., 3,744,970.

Muenker, Adolf H.; Beach, Leland K.; and Engel, Lawrence J., to Esso Research and Engineering Company. Highly plasticized binder for solid propellants. 3,745,075, Cl. 149-19.000.

Muir, John; and Payne, Ivan Marshall, to Shaw Pipe Industries Ltd. High temperature pipeline joints. 3,744,823, Cl. 285-21.000.

Muller, Dieter; and Jurisch, Wilhelm, to Daimler-Benz Aktiengesellschaft. Vehicle gas turbines with ratio couplings therebetween. 3,744,241, Cl. 60-39.160.

Muller, Wilhelm; and Heil, Friedrich, to Anker-Werke AG. Type setting device for postage meters. 3,744,410, Cl. 101-91.000.

Mullett, Charles E.: *See—*
Anthony, Michael P.; Goldman, Arnold J.; Kurtin, Stephen L.; and Mullett, Charles E., 3,745,550.

Mullins, James N., Jr. Automatic shoe polishing machine. 3,744,076, Cl. 15-31.000.

Munch, Ralph H.; and Thompson, Quentin E., to Monsanto Company. Impregnated capacitor. 3,745,432, Cl. 317-259.000.

Munro, Graham Donald, to T.J. & Nephew Limited. Intra-uterine device. 3,744,489, Cl. 128-130.000.

Murata Manufacturing Co., Ltd.: *See—*
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Murphy, G. W., Industries, Inc.: *See—*
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Murphy, James G. Ecologically safe anti-corrosion metal polishes. 3,745,029, Cl. 106-3.000.

Murphy, Nigel Malcolm St. John: *See—*
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Muto, Teruo, to Citizen Watch Co., Ltd. Indicating wheel driving mechanisms of timepieces. 3,744,237, Cl. 58-58.000.

Myers, Herman A., to Insta-Snap Corporation. Adjusting mechanisms for wrenches. 3,744,351, Cl. 81-129.000.

Myler, George W.; Reid, Edward A., Jr.; and Venendaal, Robert G., to Columbia Gas System Service Corporation. Tilting brazier. 3,744,475, Cl. 126-39.00r.

Nadeau, Herbert G.: *See—*
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Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,745,165.

Nagae, Tadashi; Tsuji, Nobuo; and Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Process for improving color developability of reversal photographic films. 3,745,007, Cl. 96-22.000.

Nagano, Akira: *See—*
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Nagano, Kentaro; Nomaki, Koyji; and Saoyama, Yoshihito, to Asaki Glass Company, Limited. Process for soldering difficulty solderable metals, such as Si, Ge, Al, Ti, Zr and Ta. 3,744,121, Cl. 29-502.000.

Nagata, Takashi: *See—*
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Naigai Orimono Kabushiki Kaisha: *See—*
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Nakajima, Yasuo; Nagata, Takashi; Hagiwara, Kiyokazu; and Sasaki, Reiichi, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic resonator. 3,745,385, Cl. 210-9.500.

Nakamura, Hiroshi; and Toyonaga, Noriyasu, to Fujitsu Limited. Synchronous detecting device for PSK polyphase wave. 3,745,458, Cl. 324-85.000.

Nakamura, Masanobu: *See—*
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Nakasone, Harold Y. Lever and fulcrum combination. 3,744,758, Cl. 254-129.000.

Nakazawa, Yoshiyuki; Shiba, Keisuki; Sato, Akira; and Ohki, Masanaga, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsions. 3,745,014, Cl. 96-124.000.

Naritomi, Yasumitsu, to Shigeru Kawayima. Steam generating instrument for hair-dressing. 3,745,306, Cl. 219-272.000.

Narland Products, Inc.: *See—*
Hudgin, Donald E., 3,745,011.

Nasica, Jean Roger; and Torterotot, Roland Marc, to Intercan S.A. Apparatus for metering and distributing liquid and paste-like substances. 3,744,538, Cl. 141-242.000.

National Can Corporation: *See—*
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Zundel, Arthur P., 3,744,662.

National Cash Register Company, The: *See—*
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National Engineering Co.: *See—*
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National Lumberman's Bank & Trust Company; as trustee for Blu Surf Thermo Engineering Trust: *See—*
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Navarre, William J., 25% to Blancke, Prudent O. Demountable wall partition. 3,744,199, Cl. 52-211.000.

Nave, Max J., Sr. Vehicular brake actuating device. 3,744,588, Cl. 180-94.000.

Nay, Harvey O.; Okamoto, Frank S.; Head, Robert E.; Moore, Richard E.; and Mc Dermott, John M., to Gates Learjet Corporation. Helicopter power plant system. 3,744,743, Cl. 244-17.110.

Neale, Alan J.; and Rawlings, Terence J., to Monsanto Chemicals Limited. Crosslinked aromatic polymers having direct aromatic nuclei to aromatic nuclei linkages. 3,745,062, Cl. 161-205.000.

Nederlandse Organisatie voor Toegepast: *See—*
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Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid Handel en Verkeer: *See—*
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Nederveld, Terrill L., to Packaging Corporation of America. Folding container. 3,744,698, Cl. 229-170.0rs.

Nedopil, Erich; Krohe, Wilfried; and Wittmann, Karl, to Sigri Elektrophit GmbH. Method of burning molded carbon bodies in round-down-draft kilns. 3,744,959, Cl. 432-12.000.

Nelson, George H.; Boomers, Jerry L.; and Egtvedt, Robert B., to Wolverine World Wide Inc. Heat setting apparatus. 3,744,073, Cl. 12-1.00a.

Nelson Irrigation Corporation, mesne: *See—*
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Nelson, J. Roy: *See—*
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Nelson, Roy E.; and Matthews, Charles William, to American Gilsonite Company. Insulating and corrosion protective material. 3,745,030, Cl. 106-14.000.

Nelson, Sherman A.; Nickel, Donavon D.; and Dunbar, Neil F., to Licentia Patent-Verwaltungs-G.m.b.H. Heavy duty space frame four-way space frame. 3,744,206, Cl. 52-650.000.

Nestor, Leonard R. Mechanism for rotary engine. 3,744,941, Cl. 418-61.000.

Netlon (P.T.A.) Limited: *See—*
Jorda, Jose Mas; Farre, Jacinto Fort; and Espinosa, Francisco Gutierrez, 3,744,529.

Netten, Adriaan, to U.S. Philips Corporation. Combination of a low-pressure mercury vapour discharge lamp and a glow discharge starter. 3,745,409, Cl. 315-100.000.

Nettesheim, Gottfried: *See—*

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Nichols, John A., to Mill Engineers, Inc. Shrink tunnel. 3,744,146, Cl. 34-212.000.
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Niemi, Ossi; and Juvonen, Heino, to Toyalan Terasvalmiste Ky Velj Virtanen. Shiftable packet mould partitions. 3,744,184, Cl. 49-125.000.
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Nikirk, Roger G.; and Rogers, Leo C., to Motorola, Inc. Method and means for measuring carrier lifetime in epitaxial films. 3,745,454, Cl. 324-64.000.
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Nishimura, Kazuyoshi. Sports shoe. 3,744,159, Cl. 36-2.5al.
Nishioka, Jim Z. Composite archery bow with bow limb tension control device. 3,744,473, Cl. 124-24.000.
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Norbeck, Dean K., to Borg-Warner Corporation. Liquid level protection system for refrigeration compressor. 3,744,267, Cl. 62-193.000.
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Ogden, Paul H., to Minnesota Mining and Manufacturing Company. Hydrolyzing fluorodiazadienes to form N,N'-fluoroaliphatic ureas. 3,745,169, Cl. 260-309.700.
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Ohi, Reiichi; Hayashi, Jun; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Method for making hardened gelatin images. 3,745,013, Cl. 96-111.000.
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Ohta, Kazuho; Ninomiya, Takao; Sasaki, Hirotada; Suda, Nobuaki; and Shinozaki, Masanobu, to Victor Company of Japan, Ltd. Synthesized four channel stereo from a two channel source. 3,745,254, Cl. 179-1.0gq.
Ohuchi, Hirobumi; Kurihara, Yasutoshi; Ura, Mitsuru; and Ogawa, Takuzo, to Hitachi, Ltd. Semiconductor photoelectric transducer. 3,745,424, Cl. 317-235.00r.
Oikawa, Mitsuru, to Hitachi, Ltd. Cathode ray tube screen having contiguous, overlapping color areas. 3,745,398, Cl. 313-92.00b.
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Okada, Yoshihiro: *See—*
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Olah, George, to Elliott Brothers (London) Limited. Computer checking system. 3,745,316, Cl. 235-153.00a.
Oldberg, Oscar, to United States of America, Army. Refrigeration system with heat exchanger employing eutectic. 3,744,272, Cl. 62-439.000.
O'Lenick, Anthony J.; Roome, Douglas P.; Spyra, Rudolf A.; and Wyslotsky, Thor, to Standard Packaging Corporation. Packaging machine and method. 3,744,210, Cl. 53-22.00a.
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Olmstead, John Aaron, to RCA Corporation. Insulated gate field-effect transistor with variable gain. 3,745,426, Cl. 317-235.00r.
Olsen, Gerald N.; and Washburn, Arthur R., to White Motor Corporation. Control system for transmission. 3,744,344, Cl. 74-687.000.
Olsen, Martin F. Method and apparatus for removing and reclaiming oil-slick from water. 3,745,115, Cl. 210-63.000.
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Opprecht, Paul Jakob. Method for automatic manufacture of metal container bodies, and welding machine for application thereof. 3,745,295, Cl. 219-64.000.
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Oroschakoff, Georgi. Reinforcement for reinforced concrete structures. 3,744,207, Cl. 52-664.000.
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Osburn, John D.; and White, Donald R. Magnetic field gradient apparatus and method for detecting pipeline corrosion. 3,745,452, Cl. 324-54.000.
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Overholt, Ralph E., to Western Electric Company, Incorporated. Heat-transfer device for cooling heat-generating components. 3,744,559, Cl. 165-80.000.
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Panhard, Jean J. L., to Societe de Constructions Mecaniques Panhard & Levassor. Methods of manufacturing crank-case envelopes for rotary piston internal combustion engines with sintered metal plug supports. 3,744,547, Cl. 164-61.000.
Pannell, Otis R.; and Peterson, Roy H., to United States of America, Army. Boat launching and recovery vehicular device. 3,744,072, Cl. 9-1.00t.

Papadopoulos, Demetrios Panagiotou; and Westbrook, Thomas Leslie. Participation presenter-audience reaction system. 3,744,712, Cl. 235-52.000.

Papadopoulos, Stelios B.; and Kupka, Frank, to Sperry Rand Corporation, mesne. Disc file hub mounting means. 3,745,265, Cl. 179-100.20a.

Papadopulos, Michael Savvas; and Guilford, Peter, to British Insulated Callender's Cables Limited. Methods of jointing metal pipes and other metal tubular bodies. 3,744,130, Cl. 29-628.000.

Papkov, Oleg Sergeevich: *See—*
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Parsonnet, Victor. Heart valve construction having a collagen cover encapsulation thereon. 3,744,062, Cl. 3-1.000.

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Patel, Arvind Motibhai, to International Business Machines Corporation. Error correction for two tracks in a multi-track system. 3,745,528, Cl. 340-146.1al.

Patel, Chandra K. N., to Bell Telephone Laboratories, Incorporated. Carbon dioxide laser employing multiple gases including helium. 3,745,482, Cl. 331-94.50g.

Patrick, Rudolph R., to McDowell-Wellman Engineering Company. Schnabel-type railroad car. 3,744,434, Cl. 105-367.000.

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Paul, John C., to Parker-Hannifin Corporation. Direction control valve. 3,744,521, Cl. 137-625.680.

Pavlov, Jury Vasilievich; Petrov, Alexandr Alexeevich; Nikolsky, Viktor Alexandrovich; Chunyaeva, Raisa Ivanovna; and Filin, Leonid Alexandrovich; deceased (by Bulaeva, Svetlana Ivanovna; administrator). Pelt fleshing machine. 3,744,279, Cl. 69-46.000.

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Perry, Robert J., to Phillips Petroleum Company. Polymer-handling process. 3,744,530, Cl. 138-145.000.

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Peterson, Raymond R., to General Motors Corporation. Stamped brake pedal. 3,744,340, Cl. 74-560.000.

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Pisano, Alan D., to General Electric Company. Electrostatic shield allowing substantially complete electromagnetic propagation from a transmitter. 3,745,466, Cl. 325-119.000.

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Placke, Eugene A., to AMF Incorporated. Method and apparatus for testing welded pipe for anomalies with means to change the sensitivity when testing the welded area. 3,745,449, Cl. 324-37.000.

Plaquet, Jacques Jules; and Van Swieten, Raymond Gerard. Installation for the evacuation of rocks from a working to a continuous transporter. 3,744,615, Cl. 198-36.000.

Plasser, Franz; and Theurer, Josef. Mobile track leveling and ballast tamping machine. 3,744,428, Cl. 104-12.000.

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Podgorski, Theodore J., to Honeywell Inc. Externally biased ring laser. 3,744,908, Cl. 356-106.0rl.

Poe, Lloyd Richard, to Hartwell Corporation. Latch strike for combined loads. 3,744,834, Cl. 292-302.000.

Polan, Garlan R. Grain treating and cooking apparatus. 3,744,401, Cl. 99-352.000.

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Polley, Bruce T.; and Wahlgren, Wallace W., to Rucker Company, The. Circuit breaker panelboard with grounded neutral protection. 3,745,415, Cl. 317-18.00d.

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Popper, Jakhin Boaz; and Cohen, Raphael, to Israel, Ministry of Defense, The State of. Device for providing and indication of the distance travelled by an object under conditions of acceleration. 3,744,424, Cl. 102-78.000.

Porsche, Dr.-Ing. H.c.F., K.G., Firma: *See—*
Austen, Jorg, 3,744,604.
Haustnger, Otto, 3,744,607.
Zaremba, Dieter, 3,744,075.

Porter, Virgil V. Continuous library catalog card. 3,744,820, Cl. 281-5.000.

Posner, Judd: *See—*
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Postins, John George, to Mil Limited. Haul-off machines. 3,744,695, Cl. 226-172.000.

Postma, William S.: *See—*
Erwin, Floyd Dennis; and Postma, William S., 3,745,533.

Pott, Dorothy E. Teaching device. 3,744,154, Cl. 35-35.00r.

Potter, Alexander Frank: *See—*
Cullen, John Leslie; and Potter, Alexander Frank, 3,744,853.

Powell, Donald P.: *See—*
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PPG Industries, Inc.: *See—*
Pefferman, William C., 3,744,978.
Peternel, Jacob R., 3,744,985.

Pratsch, Rudolf; Beier, Helmut; and Diskar, Klaus, to Siemens Aktiengesellschaft. Pressure-operated electrical high voltage circuit breaker. 3,745,280, Cl. 200-82.00g.

Prause, Siegfried: *See—*
Lindenberg, Hans-Georg; and Prause, Siegfried, 3,744,112.

Prentiss, William C.: *See—*
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President Shizuoka University: *See—*
Okabe, Takahiro; and Shinohara, Shigenobu, 3,745,479.

Pressed Steel Fisher Limited: *See—*
Fowler, John Edward, 3,744,732.

Preston, Charles L., to Hofstadler, Edwin P. Toilet operating and control system. 3,744,064, Cl. 4-34.000.

Prevett Associates, Inc.: *See—*
Prevett, Peter D., 3,744,932.

Prevett, Peter D., to Prevett Associates, Inc. Automatic sequence control system for pump motors and the like. 3,744,932, Cl. 417-8.000.

Price Brothers Company: *See—*
Keyser, Lewis R., 3,744,806.

Price, Donald A.: *See—*
Maxwell, Bert F.; Price, Donald A.; and Price, Harold A., 3,744,145.

Price, Harold A.: *See—*
Maxwell, Bert F.; Price, Donald A.; and Price, Harold A., 3,744,145.

Price, Peter P.; and Snyder, Nathan C., to Rapistan Incorporated. Trolley diverter. 3,744,432, Cl. 104-172.00s.

Priebe, Frank D.; Tribble, Robert G.; and Jones, Frank T., to Cities Service Oil Company. Blowout prevention apparatus. 3,744,562, Cl. 166-.500.

Prinz, Roy H.; and Kerr, Bob C., to Celanese Corporation. Stabilization of aqueous formaldehyde solutions. 3,745,190, Cl. 260-606.000.

Pritchett, Wayne W., to RFL Industries, Inc. Zero voltage firing proportional controller. 3,745,378, Cl. 307-252.00b.

Procter & Gamble Company, The: *See—*
Liepa, Alexander L., 3,744,398.
Marsan, Mario S., 3,744,494.

Proctor and Schwartz, Inc.: *See—*
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Prokofiev, Vladimir Ivanovich: *See—*
Unigovsky, Mikhail Rakhmilevich; Konovalov, Julian Konstantinovich; Rulevsky, Evgeny Vasilievich; Zakrevsky, Petr Ivanovich; Rotenfeld, Veniamin Solomonovich; Chvertko, Anatoly Ivanovich; Lebedev, Vladimir Konstantinovich; Golenzovsky, Tsezar Bronislavovic; Gorbunov, Georgy Vasilievich; Prokofiev, Vladimir Ivanovich; Zaitsev, Konkordy Ivanovich; Lifshits, Viktor Senderovich; Papkov, Oleg Sergeevich; Petrov, Georgy Nikolaevich; and Litvinchuk, Mark Davidovich, 3,745,319.

Prolizenz A.G.: *See—*
Gyongyos, Ivan, 3,744,545.

Pruckmayr, Gerfried, to Du Pont de Nemours, E. I., and Company. Polymerized ethylenically unsaturated fatty acids as emulsifiers for aqueous dispersions. 3,745,135, Cl. 260-23.0em.

Public Systems, Inc.: *See—*
Trimble, Melvin Earl, 3,745,462.

Pudel, Lothar, to Sick, Erwin. Apparatus for line-by-line photoelectric scanning of data media. 3,745,351, Cl. 250-219.00d.

Pulliam, George R.: *See—*

Mee, Jack E.; Besser, Paul J.; Pulliam, George R.; Heinz, David M.; and Elkins, Perry E., 3,745,046.

Putzer, Walter, to U.S. Philips Corporation. Oscillator circuit for several frequency ranges having plural feedback paths. 3,745,480, Cl. 331-60.000.

Puyear, Mark J. Fishing rod for closed face spinning reels. 3,744,173, Cl. 43-23.000.

Puyhaubert, Jean: *See—*
Chiron, Bernard; and Puyhaubert, Jean, 3,745,486.

Pyro-Magnetics Corporation: *See—*
Southwick, Kenneth J., 3,744,438.

Queal, Keith E. Animal feed process. 3,745,017, Cl. 99-6.000.

Queuille, Andre; and Larde, Raymond, to Roussel-UCLAF. Method for the treatment of acute or chronic diarrhea. 3,745,214, Cl. 424-78.000.

Quick, John Harvey: *See—*
Hill, Edwin T.; and Quick, John Harvey, 3,745,350.

Quickstad, La Ron O.: *See—*
Zeltwanger, Earl D.; Quickstad, La Ron O.; and Laidig, Roger D., 3,744,572.

Quigley, James R.: *See—*
Jaster, Dale R.; and Quigley, James R., 3,745,447.

Quinn, William C.; Morrfall, Albert F.; and Ross, Alexander V., to United States of America, Air Force. Wideband radar receiver protective apparatus. 3,745,567, Cl. 343-5.00r.

Racine, Raymond F.: *See—*
Barrett, Carl R., Jr.; Feeney, James E.; Goldstein, Abe; and Racine, Raymond F., 3,745,578.

Radiant Energy Systems, Inc.: *See—*
Firtz, Richard B.; Livesay, William R.; and Wing, Malcolm E., 3,745,358.

Raff Analytic Study Associates, Incorporated: *See—*
Raff, Samuel J., 3,744,350.

Raff, Samuel J., to Raff Analytic Study Associates, Incorporated. Impact wrench torque limiting device. 3,744,350, Cl. 81-52.400.

Raider, George K., to Dynamics Corporation of America. Composite air distributing, lighting and acoustical unit. 3,744,396, Cl. 98-40.0dl.

Rainbow Plastics, Inc.: *See—*
Bondhus, John M., 3,744,176.

Ralph, James L.: *See—*
Martin, Godfrey Q.; and Ralph, James L., 3,745,123.

Ramberg, Lawrence R. Reinforcing assembly and method of forming reinforced concrete building walls, roofs and the like. 3,744,194, Cl. 52-378.000.

Randell, Donald Richard: *See—*
Holt, Brian; Randell, Donald Richard; and Jack, James, 3,745,163.

Rapistan Incorporated: *See—*
Price, Peter P.; and Snyder, Nathan C., 3,744,432.

Ras, Max Junghans, to Mailander, J. G. Multicolor press and process with impression cylinder having axially shiftable sheet grippers. 3,744,415, Cl. 101-177-.

Ratner, Robert S.: *See—*
Wong, Peter J.; and Ratner, Robert S., 3,745,334.

Rauner, Frederick J., to Eastman Kodak Company. Lithographic plate densensitizer formulations. 3,745,028, Cl. 106-2.000.

Rausch, Richard E., to Universal Oil Products Company. Platinum-tin uniformly dispersed hydrocarbon conversion catalyst and process. 3,745,112, Cl. 208-139.000.

Rawlings, Terence J.: *See—*
Neale, Alan J.; and Rawlings, Terence J., 3,745,062.

Ray, Thomas A.: *See—*
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Raymond, Albert E., to Minnesota Mining and Manufacturing Company. Composition and method for surfacing leathers and leather substituted based on filled polyurethane latex. 3,745,041, Cl. 117-76.00r.

Raytheon Company: *See—*
Peterson, Robert A.; and Gilliatt, Charles L., 3,745,291.
Weil, Thomas A., 3,745,443.
Works, George A.; Murray, John C.; Ostroff, Edward D.; and Freedman, Nathan, 3,745,569.

RCA Corporation: *See—*
Braudy, Robert S., 3,745,586.
Feldstein, Nathan, 3,745,039.
Gandolfo, David Anthony; Grasse, Charles Louis; and O'Clock, George Daniel, Jr., 3,745,564.
Olmstead, John Aaron, 3,745,426.
Scott, Joseph Hurlong, Jr., 3,745,072.
Warren, Henry Ray, 3,744,696.

Rector, Carl T. Jacket construction for underwater diving garment and making the same. 3,744,052, Cl. 2-2.10r.

Redel, Karl-Georg: *See—*
Doenecke, Christian; and Redel, Karl-Georg, 3,744,989.

Reeber, Nicholas J., to Hazeltine Corporation. Electro-optical apparatus for simultaneously scanning a set of transparencies. 3,745,356, Cl. 250-220.00r.

Reed, David S.; and Cottrill, John E. Personnel shelter. 3,745,305, Cl. 219-217.000.

Reed, William G., to General Electric Company. Condensate drain subcooler for moisture separator and reheater. 3,744,459, Cl. 122-483.000.

Rees, Huw David: *See—*
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Reesen, Jorgen, to Eastman Kodak Company. Paper feed and exposure synchronizer. 3,744,900, Cl. 355-16.000.

Reeves, Sam B. Nut harvesting machine. 3,744,225, Cl. 56-328.00r.

Reeves, Wilson S.: *See—*
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Regent Machinery Corporation: *See—*
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Regie Nationale des Usines Renault: *See—*
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Piret, Jean, 3,744,605.

Reid, Carroll Glen; Hicks, Darrell D.; and Green, Charles David, to Celanese Coatings Company. Process of preparing nonaqueous dispersions of thermosetting copolymers. 3,745,137, Cl. 260-33.6ua.

Reid, Edward A., Jr.: *See—*
Myler, George W.; Reid, Edward A., Jr.; and Venendaal, Robert G., 3,744,475.

Reid, Philip L.: *See—*
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Reif, Robert B.: *See—*
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Reimer, Gerhard M.: *See—*
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Reimer, William A., to GTE Automatic Electric Laboratories, Incorporated. Flexible printed wiring switch. 3,745,288, Cl. 200-166.0pc.

Reiner, Alberto, to Laboratori Biochimici Fargal-Pharmasint S. p. A. 2-carboxy-1-benzalimino-1,5-dimethyl-2-phenyl -3-pyrazolone, organic and inorganic derivatives thereof and process for producing the same. 3,745,159, Cl. 260-240.00g.

Reisacher, Josef; Noltemeyer, Friedrich; and Schmid, Albrecht, to Daimler-Benz Aktiengesellschaft. Reciprocating piston internal combustion engine. 3,744,469, Cl. 123-195.00r.

Reiss, Lewis Philip; and Meyer, Frank L., to Shell Oil Company. Sulfur slurry preparation in pipelines. 3,745,121, Cl. 252-309.000.

Reiter, Joseph. Furniture construction. 3,744,868, Cl. 312-263.000.

Relation, Alfred E.: *See—*
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Remmey, George Bickley; and McFadden, Charles A., to Bickley Furnaces Incorporated. Tunnel kiln. 3,744,965, Cl. 432-137.000.

Renaud, Donald E., to Motorola, Inc. Decoding system for a PAL color television receiver. 3,745,239, Cl. 178-5.40r.

Renault, Norbert Emmanuel. Holder for mobile target. 3,744,796, Cl. 273-105.200.

Rench, Nicholas W.: *See—*
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Rennie, Robert Allan Campbell, to Imperial Chemical Industries, Limited. Oxidation of organic materials. 3,745,180, Cl. 260-396.00n.

Reprographic Materials, Inc.: *See—*
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Republic Steel Corporation: *See—*
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Rex Chainbelt Inc.: *See—*
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Reynolds Products, Inc.: *See—*
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RFL Industries, Inc.: *See—*
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Rheem Manufacturing Company: *See—*
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Rhodes, Herbert M. Oil mop and method of using same. 3,744,638, Cl. 210-242.000.

Rhomega Systems, Inc.: *See—*
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Rhone-Poulenc S.A.: *See—*
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Ricardo & Co., Engineers (1927) Limited: *See—*
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Rice, Edward K. Precast concrete building construction. 3,744,200, Cl. 52-227.000.

Rich, Edward, Jr.: *See—*
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Rich, Richard D.: *See—*
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Richter, Gerhard; and Poppei, Peter. Leather shaving machine. 3,744,278, Cl. 69-42.000.

Richtzenhain, Hermann; and Stephan, Rudolf, to Dynamit Nobel Aktiengesellschaft. Method for making 1,1,1-trichloroethane by photochemical chlorination of 1,1-dichloroethane. 3,745,103, Cl. 204-163.00r.

Ricker, Conrad J.: *See—*
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Ricoh Co., Ltd.: *See—*

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Kubo, Keishi; Sakai, Kiyoshi; and Ito, Kenjhi, 3,745,059.

Ridenour, Ralph G.; and Stevens, Walter Chandler, Jr., to Universal Refrigeration, Inc. Method of forming staked seal for tubular parts. 3,744,122, Cl. 29-516.000.

Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., to Lummus Company, The. Process for producing a phenol by oxidation of an aromatic hydrocarbon. 3,745,193, Cl. 260-621.00g.

Rielle, Russell A. Decorative display device. 3,744,166, Cl. 40-106.210.

Rieschel, Hans, to Hasmann, Josef and Freudenberger Winden und Hebezeuafabrik. Hydraulic hoisting apparatus for use with a road vehicle. 3,744,652, Cl. 214-392.000.

Rieve, Robert W.: *See—*
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Riggleman, Billy M.; Cohen, Mark E.; and Grable, Michael A., to United States of America, Interior. Method of preparing an asymmetric membrane from a cellulose derivative. 3,745,202, Cl. 264-41.000.

Righi, Nardino. Drive mechanism for portable record players. 3,744,328, Cl. 74-209.000.

Ringel, Reginald, to Caterpillar Tractor Company. Multi-part bearing liner. 3,744,859, Cl. 308-72.000.

Riordan, Hugh E., to Kelsey-Hayes Company. Skid control system. 3,744,852, Cl. 303-21.00p.

Rising, Donald B.: *See—*
Martin, Afton V.; Moldovan, Michael T.; Jazbutis, Anatolijus; Fourgere, Guy L.; Rising, Donald B.; Koger, Gary C.; Arciprete, Genio R.; and Svendsen, Noel, 3,744,713.

Ritzmann, Horst, to Polysius AG. Apparatus for firing or sintering fine material. 3,744,962, Cl. 432-58.000.

RMI Company: *See—*
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Robbins, Mark D.: *See—*
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Robertshaw Controls Company: *See—*
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Robins, A. H., Company, Incorporated: *See—*
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Robinson, Robert J.: *See—*
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Rogers, Leo C.: *See—*
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Rogers, Robert G., to GTE Automatic Electric Laboratories Incorporated. Microwave impedance-matching network. 3,745,488, Cl. 333-33.000.

Rogg, Herman O.: *See—*
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Rohs, Hans Gunther. Method and means for preventing regenerative chatter in a machine tool, particularly in a lathe. 3,744,353, Cl. 82-2.000.

Roland Offsetmaschinenfabrik, Faber & Schleicher AG: *See—*
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Romero, Roderic; and Thelemaque, Louis Emanuel, to Bell Telephone Laboratories, Incorporated. Path selection circuit for an end marked network. 3,745,259, Cl. 179-18.0ge.

Ronning, Jacob A. Portable blind apparatus. 3,744,842, Cl. 297-180.000.

Roome, Douglas P.: *See—*
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Roos, Erling, to Granges Essein AB, mesne. Pipe couplings. 3,744,824, Cl. 285-317.000.

Roos, Pieter: *See—*
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Rope, Barry S.; and Stooksbury, David E. Protective package and method of manufacture. 3,744,627, Cl. 206-80.00a.

Rosch, Berthold: *See—*
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Rosenbaum, Arnold Stephen, to Bell Telephone Laboratories, Incorporated. Digital transmission system with frequency weighted noise reduction. 3,745,562, Cl. 340-347.0ad.

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Ross, Donald R. Cardboard tray container. 3,744,707, Cl. 229-35.000.

Ross, Robert Martin: *See—*
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Ross, Samuel Scott. Exhaust cleaner. 3,744,221, Cl. 55-263.000.

Rotenfeld, Veniamin Solomonovich: *See—*
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Rothman, Edward S.; and Serota, Samuel, to United States of America, Agriculture. Process for equilibrating allene and methylacetylene and for recovery of pure allene from the equilibrium mixture. 3,745,195, Cl. 260-681.500.

Rothrock, Robert K.: *See—*
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Rowe, Robert Arnold. Combined filling device and vent cut-off valve for electric storage cells. 3,744,516, Cl. 137-587.000.

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Rubert, Myron Peter. Assessment of roughness. 3,744,304, Cl. 73-105.000.

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Rudolph, Hans-Heinrich; Brede, Uwe; and Bendler, Hellmut, to Dynamit Nobel Aktiengesellschaft. Electronic safety bridge primer. 3,744,416, Cl. 102-28.00m.

Ruff, John Denis. Electrostatic discharge device. 3,745,412, Cl. 317-2.00r.

Rulevsky, Evgeny Vasilievich: *See—*
Unigovsky, Mikhail Rakhmilevich; Konovalov, Julian Konstantinovich; Rulevsky, Evgeny Vasilievich; Zakrevsky, Petr Ivanovich; Rotenfeld, Veniamin Solomonovich; Chvertko, Anatoly Ivanovich; Lebedev, Vladimir Konstantinovich; Golenzovsky, Tsezar Bronislavovic; Gorbunov, Georgy Vasilievich; Prokofiev, Vladimir Ivanovich; Zaitsev, Konkordy Ivanovich; Lifshits, Viktor Senderovich; Papkov, Oleg Sergeevich; Petrov, Georgy Nikolaevich; and Litvinchuk, Mark Davidovich, 3,745,319.

Runey, George P., Jr. Lantern holder. 3,745,329, Cl. 240-52.100.

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Karlsson, Ake Gustav-Adolph; and Svenning, Bengt Furchtegott Staffan, 3,744,335.

Sable, Arthur J., to International Business Machines Corporation. Method of preparing documents. 3,744,899, Cl. 355-14.000.

Sablom, Louis F., Jr., to S.K.A.S.S. Associates Ltd. Bumper guard for aluminum siding. 3,744,203, Cl. 52-624.000.

Sabol, Alexander B.; and Stewart, Roger B., to United States of America, National Aeronautics and Space Administration. Apparatus and method for generating large mass flow of high temperature air at hypersonic speeds. 3,744,305, Cl. 73-147.000.

Saeki, Taiichi, to Matsushita Electric Industrial Co., Ltd. High voltage generating device. 3,745,438, Cl. 321-8.00r.

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Sakitani, Yoshio, to Hitachi, Ltd. Specimen positioning device for electron microscope and the like. 3,745,341, Cl. 250-49.50b.

Saklikar, Arvind R.: *See—*
Savit, Joseph; Guzik, Rudolph P.; Wayne, Harry A.; Saklikar, Arvind R.; and Van Eck, Jack M., 3,744,452.

Salice, Luciano; and Sebin, Silvio, to S.P.A. Arturo Salice. Device for concealed linked hinges, apt to automatically hide a door, cabinet door or flap door shut. 3,744,086, Cl. 16-164.000.

Salmonson, Vernon C. Gas control beer dispenser. 3,744,680, Cl. 222-399.000.

Salto, Shoichi: *See—*
Sato, Masaaki; Salto, Shoichi; and Kosaka, Shinya, 3,744,906.

Saltzberg, Burton R.: *See—*
Boyd, Kenneth Williamson; Saltzberg, Burton R.; and Zydney, Herbert Mortimer, 3,745,361.

Sandberg, Gary K., to Omark Industries, Inc. Energy absorbing fastener structures. 3,744,818, Cl. 280-150.00b.

Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Pneumatic cylinder-piston unit for railway brake riggings. 3,744,596, Cl. 188-203.000.

Sanders, J. L.: *See—*
White, Bobbie L.; and Sanders, J. L., 3,744,757.

Sanders Nuclear Corporation: *See—*
Parker, Eugene K.; Mayo, Kenneth E.; and Harvey, Douglas G., 3,744,053.

Sanderson, William A.: *See—*
Swidler, Ronald; Sanderson, William A.; Gamarra, Jose P.; and Mueller, William A., 3,744,970.

Sandoz-Wander, Inc.: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,745,165.

Sangster, Frederik Leonard Johan, to U.S. Philips Corporation. Bucket bridgade delay line. 3,745,383, Cl. 307-293.000.

Santistevan, Joe A., to Clete Brewer Tool Company. Device for removing armor from cables or the like. 3,744,230, Cl. 57-2.300.

Saoyama, Yoshihito: *See—*
Nagano, Kentaro; Nomaki, Koyji; and Saoyama, Yoshihito, 3,744,121.

Sartori, Guido: *See—*
Baldwin, Francis Paul; Sartori, Guido; and Lefeevre, Jean, 3,745,143.

Sarvay, J. Thomas; and Orend, Michael M., to Standard Products Company, The. Lock strip inserting tool. 3,744,113, Cl. 29-235.000.

Sasaki, Hirotada: *See—*
Ohta, Kazuho; Ninomiya, Takao; Sasaki, Hirotada; Suda, Nobuaki; and Shinozaki, Masanobu, 3,745,254.

Sasaki, Reiichi: *See—*
Nakajima, Yasuo; Nagata, Takashi; Hagiwara, Kiyokazu; and Sasaki, Reiichi, 3,745,385.

Sato, Akira: *See—*
Nakazawa, Yoshiyuki; Shiba, Keisuki; Sato, Akira; and Ohki, Masanaga, 3,745,014.

Sato, Kazuo; and Hisatsune, Tomio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of protecting passengers in a moving vehicle upon collision thereof. 3,745,572, Cl. 343-7.0ed.

Sato, Kunio: *See—*
Ishida, Tumio; Sato, Kunio; Sugihara, Kanji; and Yoshida, Shigeru, 3,745,507.

Sato, Masaaki; Salto, Shoichi; and Kosaka, Shinya, to Olympus Optical Company, Ltd. Device for determining the distance of an object from an endoscope and device therefor. 3,744,906, Cl. 356-4.000.

Sato, Osamu. Process for the manufacture of foamed porcelain-like shaped articles. 3,744,984, Cl. 65-22.000.

Satoh, Daisuke, to Shionogi & Co., Ltd. Novel process for partial hydrolysis of glycosides and some products thereof. 3,745,156, Cl. 260-210.500.

Saunders, Harvey F., Jr. Open container adaptor. 3,744,671, Cl. 220-90.000.

Savit, Joseph; Guzik, Rudolph P.; Wayne, Harry A.; Saklikar, Arvind R.; and Van Eck, Jack M., to American Photocopy Equipment Company. Electrostatic developing system with cylindrical drum liquid contact unit. 3,744,452, Cl. 118-637.000.

Sawyer, Carleton E., to Display Components, Inc. Fiberous shield means for a magnetic focus coil. 3,745,494, Cl. 335-210.000.

Scala, Luciano; Ciliberti, David F.; and Berg, Daniel, to Westinghouse Electric Corporation. Interface condensation desalination membranes. 3,744,642, Cl. 210-500.000.

Schaefer, Josef: *See—*
Wolff, Joachim; and Schaefer, Josef, 3,744,503.

Schalles, Erhard, to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft. Lathe chuck with exchangeable jaws and jaw changing means therefor. 3,744,125, Cl. 29-568.000.

Scheffler, Friedrich; and von Starck, Axel, to AEG-Elotherm G.m.b.H. Electromagnetic conveying trough. 3,744,933, Cl. 417-50.000.

Schelkmann, Wilhelm. Apparatus for retreading of vehicle tires. 3,745,084, Cl. 156-394.000.

Schernenberg, Hans O., to Daimler-Benz Aktiengesellschaft. Inflatable gas cushion for the protection of vehicle passengers, especially motor vehicles. 3,744,815, Cl. 280-150.0ab.

Schiemann, Wolfram. Container. 3,744,656, Cl. 215-31.000.

Schifrine, Jean: *See—*
Daugny, Bertrand; and Schifrine, Jean, 3,745,574.

Schimkat, Harald; and Lincke, Wolfgang, to Volkswagenwerk Aktiengesellschaft. Steering arrangement for vehicles, especially for motor vehicles, having a compensation for sidewise force affects. 3,744,587, Cl. 180-79.20r.

Schindler, Hans R.; and Vettiger, Peter, to International Business Machines Corporation. Method and apparatus for generating timing pulses with varying distances. 3,745,367, Cl. 307-108.000.

Schindler, Harvey D.: *See—*
Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 3,745,193.

Schindler, John K.; and Holt, F. Sheppard, to United States of America, Air Force. Spectrum analysis radar. 3,745,568, Cl. 343-5.0sa.

Schlaffer, James C.: *See—*
Morton, John Fraser; Schlaffer, James C.; Eitzel, Robert J.; and Fowler, Joseph A., 3,745,040.

Schlenz, Harry E.; deceased (by Schlenz, Norma A.; executrix). Package sewage treatment plant. 3,744,634, Cl. 210-151.000.

Schlenz, Norma A.: *See—*
Schlenz, Harry E., 3,744,634.

Schlicht, Werner, to Alfa-Laval Bergedorfer Eisenwerke GmbH. Homogenizing method and apparatus. 3,744,762, Cl. 259-4.000.

Schlumberger Technology Corporation: *See—*
Zill, Fred W., 3,745,521.

Schmalbach-Lubeca-Werke Aktiengesellschaft: *See—*
Schmidt, Adolf, 3,745,299.

Schmid, Albrecht: *See—*
Reisacher, Josef; Noltemeyer, Friedrich; and Schmid, Albrecht, 3,744,469.

Schmid, Henry S. Split tube cord and bead puzzle. 3,744,798, Cl. 723-159.000.

Schmidt, Adolf, to Schmalbach-Lubeca-Werke Aktiengesellschaft. Projection welding means and fitting for use therein. 3,745,299, Cl. 219-93.000.

Schmidt, Eckart W.: *See—*
Good, Carl D.; Poole, Donald R.; and Schmidt, Eckart W., 3,744,427.

Schmidt, Henry, Jr.; and Zievers, James F., to Industrial Filter & Pump Mfg. Co. Filter apparatus and method of filtration. 3,744,633, Cl. 210-82.000.

Schmidt, Henry, Jr., to Industrial Filter & Pump Mfg. Co. Air vented filter leaf. 3,744,641, Cl. 210-486.000.

Schmidt, Joseph J., to Builders Brass Works Corporation. Key actuated bolt lock. 3,744,283, Cl. 70-90.000.

Schmidt, Leo. Camper with expandable top. 3,744,841, Cl. 296-27.000.

Schmitz, Raymond J., to Motorola, Inc. Integral handle and cover release mechanism for an electronic equipment cabinet. 3,744,864, Cl. 312-244.000.

Schnef, Dieter: *See—*
Kramer, Wilhelm; and Schnef, Dieter, 3,745,285.

Schneider, Klaus; and Flaschar, Heinz, to Bosch, Robert, G.m.b.H. Hydraulic valve control apparatus. 3,744,374, Cl. 91-363.00r.

Schnoring, Hildegard; and Zucker, Friedrich J., to Bayer Aktiengesellschaft and Deutsche Supraton, Bruchmann & Zucker KG. Apparatus for producing emulsions or suspensions. 3,744,763, Cl. 259-7.000.

Scholl, Jule A. Boring and facing apparatus. 3,744,352, Cl. 82-1.200.

Schoonover, Richard H.A., to Formac International Inc., mesne. Track mounting and tensioning assembly for tracked vehicles. 3,744,857, Cl. 305-10.000.

Schuler, Edward F., to Baxter Laboratories, Inc. Husk-free mash process. 3,745,018, Cl. 99-52.000.

Schuler, Leo H. Rotary layout stand. 3,744,138, Cl. 33-174.0ta.

Schuler, Rolf: *See—*
Frutiger, Peter; and Schuler, Rolf, 3,745,534.

Schultz, Robert B. Aquatic protective garment. 3,744,054, Cl. 2-2.10r.

Schuman, Elaine J.: *See—*
Schuman, Seymour C.; Rieve, Robert W.; and Shalit, Harold, 3,745,108.

Schuman, Seymour C.; deceased (by Schuman, Elaine J.; legal representative); Rieve, Robert W.; and Shalit, Harold, to Atlantic Richfield Company. Coal processing. 3,745,108, Cl. 208-10.000.

Schump, Mike: *See—*
Adams, Lowell K.; and Schump, Mike, 3,744,621.

Schwartz, Kenneth P. High strength, high temperature self-lubricating bearing retainer. 3,744,862, Cl. 308-201.000.

Schwartz, Robert L.: *See*—
Cook, Henry S.; and Schwartz, Robert L., 3,744,819.
Schwerdt, Paul: *See*—
Burckhardt, Manfred H.; Lutze, Walter; and Schwerdt, Paul, 3,745,390.
Scintrex Limited: *See*—
Seigel, Harold Oscar, 3,745,445.
Scott, Joseph Hurlong, Jr., to RCA Corporation. Semiconductor device fabrication. 3,745,072, Cl. 148-175.000.
Scott, Lewis F., 1/2 to Franke Plating Works, Inc. Apparatus for treating cyanide wastes. 3,744,977, Cl. 23-260.000.
Scott, Milton J.; Stevens, Harry M.; and Stenzel, Hans-Jurgen A., to Monsanto Company. Composite ferrophosphorus composition. 3,744,999, Cl. 75-132.000.
Scott Paper Company: *See*—
Zarebski, Edward, 3,745,012.
Scripto, Inc.: *See*—
Fuller, David L., 3,744,387.
Sealectro Corporation: *See*—
Brishka, Alexander R., 3,745,514.
Seamon, James H. Label holder for automatic car identification system. 3,745,355, Cl. 250-219.00d.
Sebin, Silvio: *See*—
Salice, Luciano; and Sebin, Silvio, 3,744,086.
Security Techniques, Inc.: *See*—
Barmherzig, Sam, 3,744,285.
Sedam, Jason K., to Coca-Cola Company, The. Agitating apparatus. 3,744,764, Cl. 259-44.000.
Seeger, Donald D., to United States of America, Army. Explosive safe and arming system. 3,744,421, Cl. 102-70.00r.
Seemann, Bruce R.: *See*—
Van Middlesworth, Peter Q.; Buck, Marvin E.; and Seemann, Bruce R., 3,745,021.
Segal, Leon, to Allied Chemical Corporation. Shapable fiber-reinforced novaculite-filled low molecular weight polyethylene terephthalate. 3,745,140, Cl. 260-40.00r.
Seigel, Harold Oscar, to Scintrex Limited. Magnetic induced polarization method for geophysical prospecting. 3,745,445, Cl. 324-1.000.
Seisograph Service Corporation: *See*—
Norris, William F., 3,745,446.
Seite, Guy Henri: *See*—
Godin, Pascal Albert; Seite, Guy Henri; DuPont, Bertrand Georges; and Vidal, Max Laurent, 3,744,740.
Seitz, Helmut, to Morat, Franz, GmbH, Firma. System for printing a pattern with K lines either point by point or line by line. 3,745,243, Cl. 178-6.60r.
Sekiya, Setsuro; Ando, Motonobu,; and Nunotaki, Yoshihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for connecting power transmission member of drive shaft. 3,744,274, Cl. 64-30.00c.
Sekur-It Products, Inc.: *See*—
Hemphill, Robert W., 3,744,282.
Sell, Helmut: *See*—
Hagel, Adolf; and Sell, Helmut, 3,744,276.
Sell, William Henry, Jr., to Isotopes, Inc. Thermal block. 3,744,560, Cl. 165-185.000.
Semiconductor Electronic Memories Incorporated: *See*—
Henebry, Thomas F.; and Platter, Sanford, 3,744,650.
Senn, James C.: *See*—
Nichols, Frederick J.; Luce, Carl T.; and Senn, James C., 3,745,226.
Serafini, Tito T.; Delvigs, Peter; and Lightsey, George R., to United States of America, National Aeronautics and Space Administration. Preparation of polyimides from mixtures of monomeric diamines and esters of polycarboxylic acids. 3,745,149, Cl. 260-65.00.
Serota, Samuel: *See*—
Rothman, Edward S.; and Serota, Samuel, 3,745,195.
Wrigley, Arthur N.; Bistline, Raymond G., Jr.; Rothman, Edward S.; Serota, Samuel; and Stirton, Alexander J., 3,745,181.
Service d'Exploitation Industrielle de Tabacs: *See*—
Imbert, Pierre, 3,744,498.
Setty, Richard D.: *See*—
Werner, Ben E.; and Setty, Richard D., 3,744,613.
Seyfried, Richard F., to Park-Ohio Industries, Inc. Ground detector improvement. 3,745,293, Cl. 219-10.750.
SFS Industries: *See*—
Teleizoff, Louis E., 3,745,204.
Sgarbi, Renato: *See*—
Mariani, Brunello; and Sgarbi, Renato, 3,745,157.
Shah, Jashwant J., to Bigelow-Sanford, Inc. Composite false-twist yarn. 3,744,232, Cl. 57-140.0by.
Shalit, Harold: *See*—
Schuman, Seymour C.; Rieve, Robert W.; and Shalit, Harold, 3,745,108.
Shapiro, Ilya Samoilovich; Persits, Lev Moiseevich; Tkachev, Mikhail Vasilievich; and Linetsky, Lev Efimovich. Method of control over operating conditions of an apparatus for plasma-arc treatment of articles and an apparatus for plasma-arc treatment. 3,745321, Cl. 219-121.00p.
Sharp, Donald Jex, to Western Electric Company, Incorporated. Bistable optical device. 3,745,538, Cl. 340-173.0ch.
Sharpe, Andrew Jackson, Jr.: *See*—
Szabo, Miklos Tamas; Boothe, Jerry Emile; Sharpe, Andrew Jackson, Jr.; and Martin, Fred David, 3,744,566.
Sharpless, Samuel H. Sanding machine. 3,744,188, Cl. 51-174.000.
Shatto, Howard L., Jr.; and Van Dommelen, Johannes A. W. J., to Shell Oil Company. Displaceable guide funnel for submerged wellheads. 3,744,561, Cl. 166-.500.
Shaw & Slavsky, Inc.: *See*—
Slavsky, Robert J., 3,744,167.
Shaw, Daniel G.: *See*—
Slator, Damon T.; and Shaw, Daniel G., 3,744,356.
Shaw, Harold N., to Beatrice Foods Co. Steam cooking apparatus and method. 3,744,474, Cl. 126-20.000.
Shaw, Joseph D. Programmed dispenser. 3,744,867, Cl. 312-234.000.
Shaw Pipe Industries Ltd.: *See*—
Muir, John; and Payne, Ivan Marshall, 3,744,823.
Shaw, Robert H. Transporting and launching arrangements for amphibious campers. 3,744,070, Cl. 9-1.00t.
Shawcross, George A.; Shawcross, Ian; and Shawcross, Kevin. Impact fire protective switch for motor vehicles. 3,745,277, Cl. 200-61.500.
Shawcross, Ian: *See*—
Shawcross, George A.; Shawcross, Ian; and Shawcross, Kevin, 3,745,277.
Shawcross, Kevin: *See*—
Shawcross, George A.; Shawcross, Ian; and Shawcross, Kevin, 3,745,277.
Shears, Stuart T., to TRW Inc. Security clip. 3,744,691, Cl. 225-84.000.
Shefler, Sydney; and Duff, Harold S., to United States of America, Navy. Target marking device. 3,745,324, Cl. 240-2.250.
Shell Oil Company: *See*—
Gable, Charles M.; and Freitas, Ernest R., 3,745,124.
June, Ronald K., 3,745,122.
Martin, Godfrey Q.; and Ralph, James L., 3,745,123.
Reiss, Lewis Philip; and Meyer, Frank L., 3,745,121.
Shatto, Howard L., Jr.; and Van Dommelen, Johannes A. W. J., 3,744,561.
Soloway, Samuel B.; and Morales, Juan G., 3,745,198.
Vanderwater, Robert G., 3,745,092.
Vondrak, Mary Frances, 3,745,120.
Shelton, Joe; Hagood, Jerry W.; and Norman, Ralph L. Field effect electron emitter. 3,745,402, Cl. 313-309.000.
Shen, Tsung-Ying; Walford, Gordon L.; and Witzel, Bruce E., to Merck & Co., Inc. Phenyl-hydroxy-pyrazine carboxylic acids and derivatives. 3,745,161, Cl. 260-250.00r.
Shepherd, Stephan C., to Maxant Button & Supply Co. Method and apparatus for tufting upholstery and the like. 3,744,097, Cl. 24-90.00b.
Sherrill, Ernest Kohn; Hall, James M.; and Barnard, Ralph G., to Fieldcrest Mills, Inc. Electric blanket and method of forming same. 3,745,301, Cl. 219-212.000.
Shiba Electric Co., Ltd.: *See*—
Karato, Yoshiteru, 3,745,236.
Karato, Yoshiteru, 3,745,237.
Shiba, Keisuki: *See*—
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Shigeru Kawayima: *See*—
Naritomi, Yasumitsu, 3,745,306.
Shin, Kju Hi; and Zaweski, Edward F., to Ethyl Corporation. Stabilized organic compositions. 3,745,148, Cl. 260-45.95c.
Shinohara, Shigenobu: *See*—
Okabe, Takahiro; and Shinohara, Shigenobu, 3,745,479.
Shinopulos, George, to Kennecott Copper Corporation. Copper tool material for electrical discharge machining. 3,745,296, Cl. 219-69.00e.
Shinozaki, Masanobu: *See*—
Ohta, Kazuho; Ninomiya, Takao; Sasaki, Hirotada; Suda, Nobuaki; and Shinozaki, Masanobu, 3,745,254.
Shioda, Takeshi: *See*—
Watanabe, Osamu; Shioda, Takeshi; and Kanai, Kenji, 3,745,502.
Shionogi & Co., Ltd.: *See*—
Satoh, Daisuke, 3,745,156.
Shipsey, Raymond Henry, to Frank, Charles, Limited. Optical projection device. 3,744,892, Cl. 353-63.000.
Shishido, Tadao: *See*—
Ohi, Reiichi; Hayashi, Jun; and Shishido, Tadao, 3,745,013.
Shooter, Kenneth L.; Cone, Richard E.; and Bajtosh, Steve E., to National Cash Register Company, The. Rotating mechanism. 3,744,614, Cl. 198-33.0ab.
Showa Denko Kabushiki Kaisha: *See*—
Omura, Yoshihiko; and Watanabe, Elizaburo, 3,744,987.
Shults, Wilbur D., II: *See*—
Maddox, Wayne L.; Coleman, Robert L.; and Shults, Wilbur D., II, 3,744,974.
Sick, Erwin: *See*—
Pudel, Lothar, 3,745,351.
Sick, Erwin. Photoelectric length measuring apparatus. 3,744,915, Cl. 356-160.000.
Sickman, Darrell V.; Kamlet, Mortimer J.; Rich, Richard D.; Heller, Harry; and Kaplan, Lloyd A., to United States of America, Navy. Propellant composition with a nitro containing crosslinked binder. 3,745,076, Cl. 149-19.000.
Siemens Aktiengesellschaft: *See*—
Baur, Friedrich; and Naujoks, Jurgen, 3,745,576.
Henker, Heinz, 3,744,902.
Kiemle, Horst; and Wolff, Ulrich, 3,744,878.
Klein, Heinrich, 3,744,220.
Niedereder, Martin, 3,745,266.

Paul, Bernt, 3,745,360.
Pratsch, Rudolf; Beier, Helmut; and Diskar, Klaus, 3,745,280.
Traub, Karl, 3,745,490.
Sigri Elektrographit GmbH: *See—*
Krohe, Wilfried; and Rosch, Berthold, 3,744,966.
Sigri Elektrophit GmbH: *See—*
Nedopil, Erich; Krohe, Wilfried; and Wittmann, Karl, 3,744,959.
Silva, Antonio V.; and Gaines, George P., to Westinghouse Electric Corporation. Hydraulic interstand tension regulating and automatic gauge control system for multi-stand rolling mills. 3,744,287, Cl. 72-8.000.
Silver, Francis M.: *See—*
Fraze, Ermal C.; and Silver, Francis M., 3,744,667.
Simister, Louis W. Baby expansion-slipper. 3,744,163, Cl. 36-2.50b.
Simmonds, C. Warren: *See—*
Jepperson, Richard M.; and Simmonds, C. Warren, 3,745,549.
Simmons, Duwayne: *See—*
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Simon, Martin, to General Electric Company. Dual source auxiliary power supply. 3,745,366, Cl. 307-68.000.
Simon, Robert A., to Union Electronics. Flat wound coils. 3,745,500, Cl. 336-192.000.
Simpson, W. Dwain: *See—*
Emerson, S. Thomas; Simpson, W. Dwain; and Sutter, Richard J., 3,745,264.
Singer Company, The: *See—*
Current, Wayne A., 3,744,443.
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Gross, Robert D., 3,745,513.
Singewald, Arno: *See—*
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Siroman, Larry J., to Daniel Industries, Inc. Digital multiplying circuit. 3,745,318, Cl. 235-156.000.
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Cook, Shirl E.; and Sistrunk, Thomas O., 3,745,185.
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Skelton, Jon V.; and Relation, Alfred E., to ESB Incorporated. Diode monitoring systems. 3,745,548, Cl. 340-253.00e.
SKF Industrial Trading and Development Company, N.V.: *See—*
Nilsson, Sven Walter, 3,744,332.
Nyberg, Bengt Johan, 3,744,776.
Skobel, Max, to Dow Corning Corporation. Apparatus for forming rigid web-reinforced composites. 3,744,947, Cl. 425-114.000.
Slator, Damon T.; and Shaw, Daniel G., to Bowen Tools, Inc. Pipe beveling apparatus. 3,744,356, Cl. 82-4.00c.
Slavsky, Robert J., to Shaw & Slavsky, Inc. Collapsible sign display stand. 3,744,167, Cl. 40-125.00h.
Smedberg, George E., to Du Pont de Nemours, E. I., and Company. High filler content hot melt backsize adhesive compositions. 3,745,054, Cl. 161-67.000.
Smith, Charles W., to GTE Sylvania Incorporated. Apparatus for measuring and marking aperture masks. 3,744,905, Cl. 356-156.000.
Smith, Donald D.; and O'Dowd, Richard J. Earth working and planting apparatus and method. 3,744,441, Cl. 111-1.000.
Smith, Edwin J.; and Reif, Robert B., to National Steel Corporation. Electrostatic coating of metal powder on metal strip. 3,745,034, Cl. 117-17.000.
Smith, Harold J., to General Electric Company. Voltage stabilizing transformer. 3,745,499, Cl. 336-160.000.
Smith, James S., Jr. Caster brush assembly. 3,744,080, Cl. 15-256.510.
Smith, Julian V.: *See—*
Tracy, Charles W.; and Smith, Julian V., 3,744,435.
Smith Kline & French Laboratories: *See—*
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Parish, Roger C.; and Trei, John E., 3,745,221.
Smith Kline & French Laboratories, Inc.: *See—*
Jen, Timothy Yu-Wen; and Loev, Bernard, 3,745,216.
Smith, Lyle Douglas. Alarm apparatus and method. 3,745,551, Cl. 340-276.000.
Smith, Reginald James: *See—*
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Smith, Robert H.; Tonjes, Burl D.; and Leader, Charles B., to Gilson Screen Company. Reciprocating sieve shaker apparatus. 3,744,631, Cl. 209-319.000.
Smith, Robert Leonard Masytn, to M.F.C. Survival Limited. Lifting means. 3,744,756, Cl. 254-93.0hp.
Smith, Samuel Joseph, III, to Thiele Kaolin Company. Kaolin flotation process. 3,744,630, Cl. 209-166.000.
Smith, Thomas R., to Maytag Company, The. Brake for centrifugal extractor. 3,744,711, Cl. 233-24.000.
Smith, William E. Bait fish rigging. 3,744,179, Cl. 43-44.400.
Smiths Industries Limited: *See—*
Anderson, Edward William, 3,744,312.
Smolker, Gary S.: *See—*
Chernick, Leon; Ichiroku, Kikuo; and Smolker, Gary S., 3,745,227.
Smyth, Donald Nation, to S. A. Brush Company, Limited. Carpet sweepers. 3,744,077, Cl. 15-41.00r.
Snodgrass, Robert E., to United States of America, Army. Blank firing attachment. 3,744,370, Cl. 89-14.00e.
Snowden, Bryan T., to FEI, Inc. Vaporizing apparatus for treatment of animal carcasses. 3,744,088, Cl. 17-11.200.
Snyder, John A.: *See—*
United States of America, National Aeronautics and Space Administration, 3,744,510.
Snyder, Nathan C.: *See—*
Price, Peter P.; and Snyder, Nathan C., 3,744,432.
Sochard, Irving I, to United States of America, Navy. Distance measuring device and method. 3,745,517, Cl. 340-1.00r.
Societa Italiana Resine S.P.A.: *See—*
Marranci, Giulio; Bianchi, Gerardo; and Barbon, Alessandro, 3,745,125.
Societe Anonyme d'Etudes et Realisations Nucleaires Sodern: *See—*
Godin, Pascal Albert; Seite, Guy Henri; DuPont, Bertrand Georges; and Vidal, Max Laurent, 3,744,740.
Societe Anonyme pour Tous Appareillages Mecaniques (S.A.T.A.M.): *See—*
Huvey, Michel; and Le Meur, Germain, 3,744,505.
Societe Anonyme: Nodet-Gougis: *See—*
Grataloup, Xavier Roger, 3,744,725.
Societe d'Applications des Machines Motrices: *See—*
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Societe d'Etudes Scientifiques et Industrielles de L'Ile-de France: *See—*
Thominet, Michel Leon, 3,745,175.
Societe Legnes Telegraphiques et Telephoniques: *See—*
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Bouiller, Jean Georges; Joubert, Raymond Jean Maurice; Lacroix, Armand Jean-Baptiste; and Bauer, Louis Jules, deceased (said Bouiller, said Joubert and said Lacroix assors. to), 3,744,861.
Societe Nationale Industrielle Aerospatiale: *See—*
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Societe Rhodiaceta: *See—*
Bonnard, Lucien; Pich, Rene; and Palsky, Alain, 3,745,141.
Sofer, George A.; Tulenko, James S.; and Tomonto, James F., to United Nuclear Corporation. Fuel assemblies containing $UO_2$ and $PuO_2$-$UO_2$ for water cooled nuclear reactors. 3,745,069, Cl. 176-78.000.
Soffer, Jacques; and Vidal, Gilbert. Self-excitation device for an alternator. 3,745,441, Cl. 322-20.000.
Sohner, Gerhard: *See—*
Brammer, Harmut; Hohne, Gerd; Jakob, Gert; Kalippke, Harold; Sohner, Gerhard; Ehrmann, Karl; and Brand, Gunter, 3,744,466.
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Dorey, Howard Anthony, 3,745,556.
Soloway, Samuel B.; and Morales, Juan G., to Shell Oil Company. O-halovinyl phosphorothionates. 3,745,198, Cl. 260-957.000.
Soltau, John Peter, to Lucas, Joseph, (Industries) Limited. Arrangement for controlling the pressure on the inlet manifold of an internal combustion engine. 3,744,464, Cl. 123-119.00d.
Solvay & Cie: *See—*
Bequet, Jean Francois; Van Asbroeck, Roger; and Du Bois, Paul, 3,744,952.
Song, John S. Easily openable sealed plastic closure. 3,744,675, Cl. 222-153.000.
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Fuse, Yuzo, 3,745,405.
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South African Inventions Development Corporation: *See—*
Huisman, Peter Hendrik; and Jelier, Cornelis Adrianus, 3,744,774.
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S.P.A. Arturo Salice: *See—*
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Spanel, Abram N. Grout accommodating shells for easy storage and transport. 3,744,208, Cl. 52-706.000.
Spanner, William Frank. Water-surface cleansing ship. 3,744,257, Cl. 61-46.500.
Sperry Rand Corporation, mesne: *See—*
Papadopoulos, Stelios B.; and Kupka, Frank, 3,745,265.

Spicer, Oliver V., to Interstate Instruments, Inc. Photographic developing machine automatic cutoff. 3,745,368, Cl. 307-116.000.
Spiegel, Lawrence S.: *See—*
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Spilhaus, Athelstan F., to Nautilus Press Inc. Tide computation apparatus and method of using the same. 3,745,313, Cl. 235-88.000.
Spires, Archie R.; and Routt, William R. Adapter for pipe machine power. 3,744,807, Cl. 279-1.00a.
Spors, James A., to Briggs & Stratton Corporation. Brusher holder for dynamoelectric machine. 3,745,393, Cl. 310-239.000.
Spoto, Victor T. Combination vial and test tube rack. 3,744,665, Cl. 220-21.000.
Spreadbury, Robert J.; and Malarkey, Terence D., to Westinghouse Electric Corporation. High integrity alternating current power supplies. 3,745,365, Cl. 307-64.000.
Spyra, Rudolf A.: *See—*
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Staas, Philip C., Jr., to Control Sciences, Inc. Random access tape machine. 3,745,531, Cl. 340-172.500.
Stacey, Hugh J., to Parker-Hannifin Corporation. Directional control valve. 3,744,518, Cl. 137-596.120.
Stafford, Robert R. Axle driven travelling-while-sprinkling irrigation apparatus. 3,744,514, Cl. 137-344.000.
Stahl, Fred F., Jr.; Eidson, J. Marvin; and Plemons, G. Dale, to Hampton Mills, Inc. Toilet seat lid cover stretcher, process and apparatus. 3,744,536, Cl. 140-88.000.
Stalling, David L.: *See—*
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Williams, Patrick Yelverton; Williams, Kerry Charles; and Heath, Charles Edward, 3,744,253.
Stamm, Robert Franz, to American Cyanamid Company. Dark trace display device employing UV phosphor plus photochromic resin inside the display screen which generates color by means of triplet-to-triplet absorption. 3,744,877, Cl. 350-160.00p.
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Standard Packaging Corporation: *See—*
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Stapleton, Robert E.; Weinbrecht, John F.; Ferdinand, Edward O.; and Hayden, James J., to United States of America, Atomic Energy Commission. Filament support structure for large electron guns. 3,745,401, Cl. 313-272.000.
Starnes, Peter Edward, to Cartner Group Limited. Particle size analysis. 3,745,339, Cl. 250-43.50d.
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Stegmann, John. Blanks for boxes. 3,744,700, Cl. 229-23.00r.
Steiger, Anton, to Sulzer Brothers Limited. Piston machine having radially disposed pistons. 3,744,380, Cl. 92-61.000.
Steigerwald-Strahltechnik GmbH: *See—*
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Steiman, Wolf: *See—*
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Stein, Arno; Owens, Alan R.; and Wright, William L., to Picker Electronics, Inc. Synchronized ultrasonic diagnostic for internal organ function testing. 3,744,479, Cl. 128-2.00s.
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Stenzel, Hans-Jurgen A.: *See—*
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Stetson, Karl A.; and Grant, Ralph M., to GCOptronics, Inc. Holographic method for interferometric measurement of material corrosion and erosion on arbitrary surfaces. 3,744,911, Cl. 356-109.000.
Stettler, Richard J.; and Verdouw, Albert J., to General Motors Corporation. Recirculating combustor. 3,744,242, Cl. 60-39.290.
Steuer, Victor F.: *See—*
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Kuhn, Wayne H.; and Harrison, Jerry W., 3,744,705.
Stoneburner, Jerry L. Ingot carrying vehicle. 3,744,839, Cl. 296-1.00r.
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Stover, Harris A., to Collins Radio Company. Detector of false VOR direction indication. 3,745,465, Cl. 325-363.000.
Straight, Frank W. Flintlock mechanism. 3,744,169, Cl. 42-69.00r.
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Strickland, Frank N., Sr. Tile setters guage. 3,744,141, Cl. 33-180.00r.
Strommes, Axel, to Atlas Copco Aktiebolag. Rock drill feed bar. 3,744,575, Cl. 173-31.000.
Struble, Glenn E., to Diamond International Corporation. Foldable carrier for bottles, glasses and the like. 3,744,704, Cl. 229-28.0bc.
Struger, Odo J.; and Erdman, Jay M., to Allen-Bradley Company. Controller output circuit. 3,745,546, Cl. 340-250.000.
Stumpf, Karl. Roll for a damming roller train. 3,744,111, Cl. 29-116.00r.
Sturman, Oded E. Shock absorbing seatbelt actuator. 3,744,814, Cl. 280-150.50b.
Suchy, William J.: *See—*
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Broeg, Charles Burton; Monti, Anthony; and Troy, John P., 3,745,022.
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Ohta, Kazuho; Ninomiya, Takao; Sasaki, Hirotada; Suda, Nobuaki; and Shinozaki, Masanobu, 3,745,254.
Sudnishnikov, Boris Vasilievich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; and Plavskikh, Vladimir Dmitrievich. Reversible percussion device. 3,744,576, Cl. 173-91.000.
Sugihara, Kanji: *See—*
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Sugimoto, Yoshiaki, to Tsubakimoto Chain Co., Ltd. Gearwheel adapted to drive a positive motion belt having elastic teeth. 3,744,330, Cl. 74-243.00r.
Sulzer Brothers Limited: *See—*
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Sulzer Brothers Ltd.: *See—*
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Sumitomo Metal Industries, Ltd.: *See—*
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Sun Chemical Corporation: *See—*
Peek, Sandford C., Jr; and Newman, Henry C., 3,745,307.

Sundermann, Erich; and Viedt, Johanna, to Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft. Method of manufacturing ceramic foam bodies. 3,745,201, Cl. 264-43.000.

Sundstrand Data Control, Inc.: *See—*
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Susquehanna Corporation, The: *See—*
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Sutter, Richard J.: *See—*
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Suzuki, Koichi; and Yamashita, Hajime, to Kabushiki Kaisha Ricoh. System for searching for desired information. 3,744,890, Cl. 353-26.000.

Suzuki, Masaru, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Combined direction, parking and hazard warning signaling apparatus. 3,745,524, Cl. 340-76.000.

Suzuki, Reiichi: *See—*
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Suzuki, Yasoji, to Tokyo Shibaura Electric Co., Ltd. Shift register using insulated gate field effect transistors. 3,745,371, Cl. 307-221.00c.

Svendsen, Noel: *See—*
Martin, Afton V.; Moldovan, Michael T.; Jazbutis, Anatolijus; Fourgere, Guy L.; Rising, Donald B.; Koger, Gary C.; Arciprete, Genio R.; and Svendsen, Noel, 3,744,713.

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Swanson, Richard Maurice: *See—*
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Swidler, Ronald; Sanderson, William A.; Gamarra, Jose P.; and Mueller, William A., to Cotton, Incorporated. Treating of cellulosic fiber-containing material to impart flame-retardancy thereto. 3,744,970, Cl. 8-116.300.

Swift & Company: *See—*
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Swift, John F., to International Harvester Company. Hydrostatic transmission motors and coordinating clutch for same. 3,744,584, Cl. 180-6.480.

Swoager, Jon R., to Automation Equipment Inc. Hydrostatic drive. 3,744,244, Cl. 60-454.000.

Sybron Corporation: *See—*
Cavigelli, George A., 3,745,459.

Sydnor, Garland S., Jr.; and Dively, Robert C., to Sydnor Hydrodynamics Inc. Mounting structure for a submerged motor. 3,745,387, Cl. 310-51.000.

Sydnor Hydrodynamics Inc.: *See—*
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Symbionics, Inc.: *See—*
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Syncro Corporation: *See—*
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Syntex Corporation: *See—*
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Syverson, Martelle J., to Fountain Industries, Inc. Mounting base assembly for product cartridges. 3,744,865, Cl. 312-35.000.

Szabo, Miklos Tamas; Boothe, Jerry Emile; Sharpe, Andrew Jackson, Jr.; and Martin, Fred David, to Calgon Corporation. Secondary oil recovery process. 3,744,566, Cl. 166-275.000.

Szatkowski, Richard R., to Continental Can Company, Inc. Sinter molding apparatus. 3,744,951, Cl. 425-259.000.

Sze, Morgan C.: *See—*
Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 3,745,193.

Szilagyi, Paul J.; and Hajdu, Juan, to Enthone, Incorporated. Alkaline bright zinc electroplating. 3,745,099, Cl. 204-55.00r.

Szymber, Oleg, to GAF Corporation. Video reproduction system for photographic and other images. 3,745,234, Cl. 178-5.20r.

Tabler, Charles P., to Kornylak Corporation. Boltless adjustable fitting. 3,744,610, Cl. 193-35.00r.

Taco, Inc.: *See—*
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Taguchi, Tetsuya: *See—*
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Tahara, Tadasu: *See—*
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Takahashi, Toshiro: *See—*
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Takayama, Katuki: *See—*
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Takeda, Hiromu; Oda, Etsuji; Sakai, Rokuro; and Tanimura, Masamitsu, to Toray Industries, Inc. Poly-epsilon-caprolactam filament useful for tire cord. 3,745,151, Cl. 260-78.00l.

Takeda, Yasutsugu; and Oshida, Yoshitada, to Hitachi, Ltd. Holographic memory system for recording digital information. 3,744,871, Cl. 350-3.500.

Takiguchi, Daigaku: *See—*
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Tanasawa, Yasushi; Inoue, Tokuta; Nohira, Hidetaka; and Yamada, Mitsumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Afterburner for an internal combustion engine. 3,744,250, Cl. 60-303.000.

Taniguchi, Kenji; Hotta, Atsuo; Imaizumi, Ichiro; and Chiba, Kouetsu, to Hitachi, Ltd. Semiconductor memory. 3,745,540, Cl. 340-173.0ff.

Tanimura, Masamitsu: *See—*
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Tannas, Lawrence E., Jr.; and York, Paul K., to Electrospin Corporation. Apparatus and method for freeing drafting rolls of adhering fibers. 3,744,231, Cl. 57-56.000.

Tantilinger, Keith W., to Rohr Corporation. Vehicle window structure. 3,744,186, Cl. 49-463.000.

Tarao, Akira: *See—*
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Taylor, Harold Mellon: *See—*
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Taylor, Joseph W., to Container Corporation of America. Heavy duty container. 3,744,701, Cl. 229-23.00r.

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Technicolor, Inc.: *See—*
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Teeple, Gifford H., Jr.; and Welsh, James W. Portable water purifier. 3,744,639, Cl. 210-265.000.

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Teledyne, Inc.: *See—*
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Teledyne Industries, Inc. (Geotech Division): *See—*
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Telefonaktiebolaget LM Ericsson: *See—*
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Tension Structures, Inc.: *See—*
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Terrell, Ross C.; and Moore, George L., to Airco, Inc. Anesthetizing composition and method. 3,745,220, Cl. 424-341.000.

Terzian, Rouben T.; and Glass, Marvin I., to Glass, Marvin, & Associates. Self-propelled toy. 3,744,182, Cl. 46-247.000.

Tesar, Ian A.; and Robbins, Mark D. Exhibit booth construction and method of assembly thereof. 3,744,437, Cl. 108-153.000.

Tetra Plastics, Inc.: *See—*
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Teubler, Heinz; and Langosch, Otto, to Vickers GmbH. Three way flow regulating valves. 3,744,509, Cl. 137-117.000.

Teves, Alfred, G.m.b.H.: *See—*
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Tewes, Udo: *See—*
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Hart, Melvin Gory, 3,744,964.
Thackrah, John Stanley, to Du Pont de Nemours, E. I., and Company. Process for dyeing napped fabrics of water swellable cellulose fibers. 3,744,967, Cl. 8-54.200.
Thanawala, Hemesh Laxmidas, to Associated Electrical Industries Limited. A.C. power system couplings. 3,745,416, Cl. 317-20.000.
Thelemaque, Louis Emanuel: *See*—
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Thomas, Edward V.; and Longley, Charles S., to United States of America, Navy. Torsional shear damped foundation member. 3,744,782, Cl. 267-154.000.
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Thominet, Michel Leon, to Societe d'Etudes Scientifiques et Industrielles de L'Ile-de France. 3-Alkoxy-thia naphthene-2-carboxamides. 3,745,175, Cl. 260-326.300.
Thompson, Albert L.: *See*—
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Thompson, Bernard L.: *See*—
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Thompson, Frank R., to Taco, Inc. Fluid flow metering device. 3,744,313, Cl. 73-208.000.
Thompson, Porl E. Sawmill game. 3,744,793, Cl. 273-1.00r.
Thompson, Quentin E.: *See*—
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Thorn Electrical Industries, Limited: *See*—
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Tichy, Melvyn R., to Deutsch Company Electronic Components Division, The. Magnetic relay members with grain of the material extending longitudinally thereof. 3,745,496, Cl. 335-230.000.
Tieman, Lloyd E.: *See*—
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United States of America, National Aeronautics and Space Administration, 3,745,255.
Tindle, Roger C.; and Stalling, David L., to United States of America, Interior. Multiple-loop chromatography system. 3,744,219, Cl. 55-162.000.
Titchenal, Oliver R.; and Armstrong, William A., to Dow Chemical Company, The. Automatic bag filling method. 3,744,211, Cl. 53-29.000.
Titov, Dmitry Vladimirovich. Beating up device for looms. 3,744,532, Cl. 139-188.000.
T.J. & Nephew Limited: *See*—
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Fudemoto, Isao; Kurita, Shichi; Tomimori, Kiyoshi; and Hayashi, Tatsuki, 3,745,257.
Tomki, Tetsuhiko; and Miyata, Takeo, to Matsushita Electric Industrial Company, Limited. Optical filter comprising a substrate of metal fluoride having deposited thereon a film of strontium or barium fluoride. 3,744,870, Cl. 350-1.000.
Tomlinson, Edward G., to Uniroyal Inc. Splice for toothed power transmission belts. 3,744,095, Cl. 24-38.000.
Tomonto, James F.: *See*—
Sofer, George A.; Tulenko, James S.; and Tomonto, James F., 3,745,069.
Tongue, Thomas O., to Grace, W. R., & Co. Venting device. 3,744,976, Cl. 23-260.000.
Tonies, Lawrence A., to Mangood Corporation. Method and apparatus for generating a read-out signal synchronized with railway vehicle movement. 3,745,335, Cl. 246-247.000.
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Toy, Arthur D. F.; and Eilers, Kenneth I., to Stauffer Chemical Company. Bis(2,3-dihalopropyl) 2-cyanoalkylphosphonates. 3,745,197, Cl. 260-940.000.
Toyalan Terasvalmiste Ky Velj Virtanen: *See*—
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Trainor, Patrick M., to Fort Lock Corporation. Tubular key. 3,744,286, Cl. 70-404.000.
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Traub, Karl, to Siemens Aktiengesellschaft. Electromechanical filter. 3,745,490, Cl. 333-71.000.
Travageio, Dalny, to Universal Pneumatic Controls, Inc. Piston actuator and mounting device therefor. 3,744,381, Cl. 92-161.000.
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Treppish, Eugene A., to Barber-Green Company. Gyratory crusher having means for retaining spring compression for concave supporting upper frame. 3,744,728, Cl. 241-207.000.
Tresch, Charles Henri; and Hancart, Aime Michel, to Societe Nationale Industrielle Aerospatiale. Double-acting, short-stroke, low-pressure damping device. 3,744,599, Cl. 188-298.000.
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Tsunoda, Shogo, to Ebara Infilco Kabushiki Kaisha. Suspension clearing treatment device. 3,744,643, Cl. 210-522.000.
Tsuruishi, Yuki, to Kabushiki Kaisha Suwa Seikosha. Electric timepiece. 3,744,233, Cl. 58-23.0tf.
Tucker, Council A.; Perkins, George; and Langworthy, James H., to American Telecommunications Corporation. Ornamental telephone construction. 3,745,267, Cl. 179-179.000.
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Turnbull, Fred C.; and Harnden, John D., Jr. Semiconductor device-metal oxide varistor-heat sink assembly. 3,745,505, Cl. 338-20.000.
Turner, John W., to United States of America, National Aeronautics and Space Administration. Measurement system. 3,745,475, Cl. 328-134.000.
Tyler, Hugh J.; and Clifford, Joseph, to Robertshaw Controls Company. Electric ignition mechanism. 3,744,955, Cl. 431-66.000.
Tyroler, Jesse F., to United States of America, Army. Flares. 3,744,418, Cl. 102-35.400.
U R Industries, Inc.: *See—*
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Uchiyama, Takashi; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. Preset stop device for interchangeable lens for single lens reflex camera. 3,744,393, Cl. 95-64.00b.
Ueno, Takahiro. Air compressor. 3,744,934, Cl. 417-237.000.
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Union Carbide Corporation: *See—*
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National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Butman, Stanley; and Timor, Uzi,. Receiver with an improved phase lock loop in a multichannel telemetry system with suppressed carrier. 3,745,255, Cl. 179-15.0fs.
Epstein, Paul; Donovan, George; and La White, Eric. Drying apparatus for photographic sheet material. 3,744,148, Cl. 34-160.000.
Fulcher, Clay W. G., to General Electric Company. Automatic control of liquid cooling garment by cutaneous and external auditory meatus temperatures. 3,744,555, Cl. 165-46.000.
Hutto, Robert J. Radiation sensitive solid state switch. 3,745,352, Cl. 250-237.00r.
Laue, Helmuth H.; and Clough, Leonard G. Driving lamps by induction. 3,745,410, Cl. 315-248.000.
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Updegrave, William J. Intraoral radiographic system for substantially confining the X-ray beam to the film. 3,745,344, Cl. 250-70.000.

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Van Cleave, Marvin A. Two-piece units longitudinally adjustable with each end terminating in means interlocking a camper body with a truck body. 3,744,840, Cl. 296-23.0mc.

Van Deelen, Wim, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid Handel en Verkeer. Apparatus for optical investigations and measurements with the aid of several coherent light beams. 3,744,910, Cl. 35-106.000.

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Van Es, Jan. Arithmetic game. 3,744,153, Cl. 35-31.00f.

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Van Overbeek, Adrianus Johannes Wilhelmus Mari; and Krul Leendert Gerdus, to U.S. Philips Corporation. Method and device for standardizing size and position of pictures. 3,745,406, Cl. 315-25.000.

Van Pee, Paul Desire; Depoorter, Henri; Ghys, Theofiel Hubert; Berendsen, Jules Robert; and Vanassche, Willy Joseph, to Agfa-Gevaert N.V. Spectral sensitization of photodevelopable silver halide emulsions. 3,745,015, Cl. 96-125.000.

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Vanderwater, Robert G., to Shell Oil Company. Recovery and purification of ethylene oxide by distillation and absorption. 3,745,092, Cl. 203-42.000.

Vantage Tool Incorporated: *See—*
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Vargo, Donald P., to American Cyanamid Company. Detector for reading bar codes on moving articles and having improved signal-to-noise ratio. 3,745,354, Cl. 250-219.00d.

Varta Aktiengesellschaft: *See—*
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VCA Corporation: *See—*
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Vega Industries, Inc.: *See—*
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Velander, Hugo W., to Borg-Warner Corporation. Furnace plenum of duct type humidifier. 3,744,773, Cl. 261-88.000.

Venendaal, Robert G.: *See—*
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Verdouw, Albert J.: *See—*
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Vernon Company, The: *See—*
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Vers, Rudi, to Fichtel & Sachs A.G. Method of assembling a resilient tube with a rigid body. 3,744,123, Cl. 29-520.000.

Verschoof, Jelis, to Werf Conrad & Strok Hysch N.V. Device for guiding a body suspended from ropes when lowering said body. 3,744,651, Cl. 214-41.000.

Vertegaal, Jacobus Gerardus, to Stork-Amsterdam N.V. Device for making a cut into the body of poultry. 3,744,087, Cl. 17-11.000.

Vestal, George W., to S & V Plastics Incorporated. Tube closure member. 3,744,528, Cl. 138-89.000.

Vettiger, Peter: *See—*
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Vibranetics, Inc.: *See—*
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Vickaryous, Michael E. Self loading scrapers. 3,744,165, Cl. 37-127.000.

Vickers GmbH: *See—*
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Victor Company of Japan, Ltd.: *See—*
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Vincent, Andrew W. Circuit for rapid charging of a capacitor. 3,745,421, Cl. 317-148.50b.

Vogt, Horst Dieter, to Ciba-Geigy AG. Arrangement for sensing damage to the edge portions of a film. 3,744,308, Cl. 73-157.000.

Vogt, Kenuo. Electrical splice. 3,745,228, Cl. 174-88.000.

Voles, Roger, to E.M.I. Limited. Improvements relating to moving target indicating systems. 3,745,570, Cl. 343-7.700.

Volkswagenwerk Aktiengesellschaft: *See—*
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von Starck, Axel: *See—*
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Vondrak, Mary Frances, to Shell Oil Company. Non-corrosive sulfur-liquid hydrocarbon slurry containing an asphaltenic compound. 3,745,120, Cl. 252-309.000.

Vorta Systems, Inc.: *See—*
Herbert, Lawrence W., 3,745,583.

Voss, James R.; and Jeney, A. Frank, to AMBAC Industries, Inc. Hydraulic shuttle valve for fuel injection pump. 3,744,465, Cl. 123-139.00m.

Wachtel, Peter: *See—*
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Wagley, Allen W., 10% to Atlantic Richfield Company. Pipe-laying machine. 3,744,259, Cl. 61-72.100.

Wagner, Earl S.; and Dinn, Vernon W., to Arvin Industries, Inc. Humidifier. 3,744,772, Cl. 261-80.000.

Wagner Electric Corporation: *See—*
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Waldenstrom, Carl G. Tamper-proof security device. 3,744,284, Cl. 70-232.000.

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Walker, Winston G., to Addmaster Corporation. Key operated switch with depressible bridging contact layer of matted unwoven electrically conductive fibers. 3,745,287, Cl. 200-159.00b.

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Wallick, Sherwin, 1/2 to Wallick, Jack L., mesne. Portable liquid spray assembly with boom and nozzle. 3,744,719, Cl. 239-199.000.

Wallskog, Alan G.: *See—*
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Walpole, David Valentine: *See—*
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Ward, Dennis J., to Universal Oil Products Company. Steam reforming of hydrocarbons. 3,744,981, Cl. 48-214.000.

Ward, Henry D., Jr., to Ward Machinery Company, The. Squaring and bundle counting machine. 3,744,649, Cl. 214-6.0ba.

Ward Machinery Company, The: *See—*
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Ware, Chester D., to Trane Company, The. Refrigeration apparatus and method of operating for powered and non-powered cooling modes. 3,744,264, Cl. 62-115.000.

Ware, Chester D., to Trane Company, The. Refrigeration apparatus and method of operating for powered and nonpowered cooling modes. 3,744,273, Cl. 62-498.000.

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Weaver, Earl Wilson, 25% to Woodyard, John D. and 25% to Weaver, Sam D. Lunch kit. 3,744,622, Cl. 206-4.000.

Weaver, Leon B.; and Pegden, Claude D., to United States of America, National Aeronautics and Space Administration. Multiple in-line docking capability for rotating space stations. 3,744,739, Cl. 244-1.0sd.

Weaver, Sam D.: *See—*
Weaver, Earl Wilson, 3,744,622.

Weber, Heinz, to Telesco Brophey Limited. Umbrella and sheath. 3,744,502, Cl. 135-20.000.

Weber, Heinz, to Telesco Brophey Limited. Shortenable umbrella. 3,744,504, Cl. 135-26.000.

Weese, Harry M. Hinged slab system of building. 3,744,196, Cl. 52-70.000.

Weichsel, Richard H., to Apex Bearings Company, The. Gas bearings. 3,744,858, Cl. 308-5.00r.

Weikel, Walter J.: *See—*
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Weis, Henry M. Automated controls for lumber drying kiln. 3,744,144, Cl. 34-16.500.

Weisbrod, Alfred L. Lamp shade. 3,745,332, Cl. 240-108.00r.

Weiss, Reinhold, to Krone GmbH. Regenerative transmission system for digital signals. 3,745,249, Cl. 178-70.00r.

Welding and Steel Fabrication Co., Inc.: *See—*
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Wellensiek, Adolph H. Outside venetian blind construction. 3,744,544, Cl. 160-169.000.

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Wells, Richard L. Dental floss roll comprising interconnected pieces each having a pick end. 3,744,499, Cl. 132-92.00a.

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West, Walter H., to Dow Chemical Company, The. Apparatus for the flanging of lined conduit. 3,744,115, Cl. 29-243.520.

Westbrook, Thomas Leslie: *See—*
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Whalen, Mark E.; Trepanier, Norman W.; and Draus, Robert A., to Republic Steel Corporation. Solid state method for consolidating small pieces of metal into a workpiece. 3,744,118, Cl. 29-403.000.

Wheeler, Ralph; and Young, Leroy P. Walled enclosures. 3,744,456, Cl. 119-20.000.

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Williams, John R.; and Norden, Burnice N., to United States of America, National Aeronautics and Space Administration. Holographic thin film analyzer. 3,744,912, Cl. 356-108.000.
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Williams, Patrick Yelverton; Williams, Kerry Charles; and Heath, Charles Edward, to Stamford Australia Pty., Ltd. Oil spill boom. 3,744,253, Cl. 61-1.00f.
Williams, Raymond Leroy, to Dresser Industries, Inc. Earth boring machine with a readily replaceable drill rod chuck. 3,744,577, Cl. 173-163.000.
Williams, Wilfred A. Magnifying attachment for tweezers. 3,744,883, Cl. 350-244.000.
Willinger, Allan H.; and Dinnerstein, Albert J., to Metaframe Corporation. Rock and gravel bed simulation for aquariums. 3,744,454, Cl. 119-5.000.
Wilsch, Herbert; and Zanner, Johann, Jr., to Agfa-Gevaert AG. Motion picture projector for use with plural types of film-containing magazine. 3,744,889, Cl. 352-72.000.
Wilson, Eldon M. Apparatus for obtaining an artificial erection. 3,744,486, Cl. 128-79.000.
Wilson, Harold W., to Golden Cycle Corporation, mesne. Process for the beneficiation of waste copper slag by removal and recovery of its content of copper and zinc. 3,744,990, Cl. 75-24.000.
Wilson, Maywood L., to United States of America, National Aeronautics and Space Administration. Nondestructive spot test method for magnesium and magnesium alloys. 3,744,972, Cl. 23-230.00r.
Wilt, Marvin Duane, to Teledyne Industries, Inc. Metal detection system for indicating the motion and direction of motion of a body having magnetic properties. 3,745,450, Cl. 324-41.000.
Wilt, Marvin Duane, to Teledyne Industries, Inc. (Geotech Division). Intrusion signature detector requiring both frequency and amplitude shifts. 3,745,552, Cl. 340-261.000.
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Wood, Dennis E., to Curlator Corporation. Mat forming apparatus for fiber web forming machine. 3,744,091, Cl. 19-156.300.
Woodruff, Oscar G. Attachment for tenderizing meat. 3,744,400, Cl. 91-345.000.
Woodward, Stephen Guild; and Treschitta, John Phillip, to Bunker-Ramo Corporation, The. High density electrical connector. 3,745,509, Cl. 339-14.00r.
Woodyard, John D.: *See—*
Weaver, Earl Wilson, 3,744,622.
Woofter, Cecil B., to Vernon Company, The. Self-locking caddy with unique suspension means. 3,744,623, Cl. 206-19.50r.
Works, George A.; Murray, John C.; Ostroff, Edward D.; and Freedman, Nathan, to Raytheon Company. Remotely powered transponder. 3,745,569, Cl. 343-6.5ss.
Worthy, Gloria V. Exercising device for the lip and cheek area. 3,744,485, Cl. 128-67.000.
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Wright, Frank, to Jaguar Cars Limited. Electrical wiring system. 3,745,419, Cl. 317-137.000.
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Yavitch, Morris. Fitting for performed shower pans. 3,744,065, Cl. 4-146.000.

Yoerger, William E.; and Staudenmayer, William J., to Eastman Kodak Company. Electrophotographic elements having barrier layers. 3,745,005, Cl. 96-1.500.

Yoneyama, Masahide, to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.). Signal processing system for multiple signal transmission. 3,745,238, Cl. 178-5.4st.

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Yoshimura, Shoichiro; Ebukuro, Rinzou; and Isono, Tomoyuki, to Nippon Electric Company, Limited. Electrooptical device for discriminating a predetermined pattern from others by detecting preselected color changes identifying the pattern. 3,745,527, Cl. 340146.30b.

Yoshioka, Yoshio, to Hitachi, Ltd. Gas-blast circuit breaker having a floating puffer piston driven by electromagnetic force. 3,745,281, Cl. 200-148.00r.

Young, Archie R., II; and Hunt, Herschel, to Thiokol Chemical Corporation. Process for preparing hydrazinium diperchlorate. 3,745,210, Cl. 423-462.000.

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Yunde, Yasufumi; Yanaka, Shigenobu; and Koike, Kouichi, to Hitachi Roentgen Co., Ltd. High resolution system for T.V. monitoring of intermittant X-ray signals. 3,745,245, Cl. 178-6.800.

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Appel, Arthur, and A. J. Stein, to International Business Machines Corp. Method for the computer generation of developments. T912,005, 7–10–73, Cl. 444—001.

Baxter, William F., Jr., and C. M. Davis. Polyethylene-wax emulsions. T912,002, 7–10–73, Cl. 106—271.

Bennett, Brian T., and A. C. McKellar, to International Business Machines Corp. Method for reordering the records of a file. T912,008, 7–10–73, Cl. 444—001.

Bouricius, Willard G., and B. J. Schultz, to International Business Machines Corp. Method for calculating survival coefficients. T912,004, 7–10–73, Cl. 444—001.

Brannon, Timothy L., H. T. Mehl, and M. R. Zick, to International Business Machines Corp. Multi-phase nucleus loading for a virtual storage system. T912,006, 7–10–73, Cl. 444—001.

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Grant, Peter M. Powder coating process. T912,001, 7–10–73, Cl. 117—017.

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Trombley, Bertrand N.: *See*—
Eicholtz, Clara V., and Trombley. 227,639.
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## ISSUED JULY 10, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**
2 3,744,055
2.1R 3,744,052
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3,744,054
54 3,744,056
146 3,744,057
157 3,744,058
250 3,744,059

**CLASS 3**
1 3,744,060
3,744,061
3,744,062
3,744,063

**CLASS 4**
34 3,744,064
146 3,744,065

**CLASS 5**
176R 3,744,066
181 3,744,068

**CLASS 6**
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**CLASS 7**
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54.2 3,744,967
94.21 3,744,969
183MP 3,744,970

**CLASS 9**
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3,744,072
2S 3,744,071

**CLASS 12**
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145 3,744,074

**CLASS 13**
10 3,745,224

**CLASS 14**
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**CLASS 15**
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41R 3,744,077
167R 3,744,078
235.7 3,744,079
256.51 3,744,080
257.1 3,744,081
402 3,744,082

**CLASS 16**
26 3,744,083
114 3,744,084
144 3,744,085
164 3,744,086

**CLASS 17**
11 3,744,087
11.2 3,744,088
25 3,744,089
70 3,744,090

**CLASS 19**
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3,744,092
240 3,744,093

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3,744,972
254EF 3,744,973
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68 3,744,145
160 3,744,148
202 3,744,149
212 3,744,146

**CLASS 35**
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19R 3,744,151
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76R 3,745,041
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211 3,745,044
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103 3,744,457

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149 3,744,498
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20M 3,744,503
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195 3,744,637
242 3,744,638
265 3,744,639
463 3,744,640
486 3,744,641
500 3,744,642
522 3,744,643

**CLASS 211**

40 3,744,644
126 3,744,645
162 3,744,646
175 3,744,647

**CLASS 214**

1BB 3,744,648
6BA 3,744,649
23 3,744,650
41 3,744,651
392 3,744,652
502 3,744,653

**CLASS 215**

9 3,744,654
3,744,655
31 3,744,656
48 3,744,657
100A 3,744,658

**CLASS 217**

7 3,744,659

**CLASS 219**

10.49 3,745,290
10.55 3,745,291
3,745,292
10.75 3,745,293
56 3,745,297
64 3,745,295
69C 3,745,298
69E 3,745,296
73 3,745,294
93 3,745,299
101 3,745,319
107 3,745,300
121EB 3,745,320
121P 3,745,321
137 3,745,322
212 3,745,301
213 3,745,302
216 3,745,304
217 3,745,305
218 3,745,303
272 3,745,306
388 3,745,307
499 3,745,308
522 3,745,309

**CLASS 220**

4D 3,744,663
10 3,744,660
3,744,664
21 3,744,661
3,744,665
27 3,744,662
48 3,744,666
3,744,667
54 3,744,668
3,744,669
57 3,744,670
90 3,744,671

**CLASS 221**

82 3,744,672
92 3,744,673

**CLASS 222**

103 3,744,674
153 3,744,675
161 3,744,676
162 3,744,677
205 3,744,678
238 3,744,679
399 3,744,680
402.11 3,744,682
402.12 3,744,681
446 3,744,683
509 3,744,684

**CLASS 223**

96 3,744,685
3,744,686

**CLASS 224**

2A 3,744,687
32R 3,744,688
42.03B 3,744,689

**CLASS 225**

2 3,744,690
84 3,744,691
96 3,744,692

**CLASS 226**

97 3,744,693
168 3,744,694
172 3,744,695
181 3,744,696

**CLASS 228**

5 3,744,697

**CLASS 229**

17RS 3,744,698
23R 3,744,699
3,744,701
3,744,702
23 3,744,700
27 3,744,703
28BC 3,744,704
33 3,744,705
34HW 3,744,706
35 3,744,707
48R 3,744,708
52BC 3,744,709

**CLASS 233**

24 3,744,710
3,744,711

**CLASS 235**

52 3,744,712
54F 3,744,713
61.11D 3,745,310
61.11E 3,745,314
61.11J 3,745,311
61.11R 3,745,312
88 3,744,714
3,745,313
92LG 3,745,315
153A 3,745,316
156 3,745,317
3,745,318

**CLASS 236**

13 3,744,715
87 3,744,716

**CLASS 239**

1 3,744,717
8 3,744,718
199 3,744,719
231 3,744,720
261 3,744,721
338 3,744,722
543 3,744,723
553.5 3,744,724
669 3,744,725

**CLASS 240**

1.3 3,745,323
3,745,325
2.25 3,745,324
3 3,745,326
9R 3,745,327
11 3,745,328
52.1 3,745,329
78F 3,745,330
81BS 3,745,331
108R 3,745,332

**CLASS 241**

30 3,744,726
93 3,744,727
207 3,744,728
239 3,744,729

**CLASS 242**

56A 3,744,730
74 3,744,731
107SB 3,744,732
107.3 3,744,733
129 3,744,734
130 3,744,735
195 3,744,736
197 3,744,737

**CLASS 244**

15D 3,744,739
15S 3,744,738
3.19 3,744,740
16 3,744,741
17.11 3,744,742
3,744,743
32 3,744,744
41 3,744,745

**CLASS 246**

169D 3,745,333
182A 3,745,334
247 3,745,335
442 3,745,336

**CLASS 248**

18 3,744,746

22 3,744,747
27 3,744,748

**CLASS 250**

41.9ME 3,745,343
41.9TF 3,745,337
43.5FL 3,745,338
43.5MR 3,745,340
43.5D 3,745,339
49.5A 3,745,342
49.5B 3,745,341
70 3,745,344
71.55 3,745,345
83.3H 3,745,347
83.3R 3,745,346
216 3,745,353
218 3,745,348
3,745,349
3,745,350
219D 3,745,351
3,745,354
3,745,355
220R 3,745,356
237R 3,745,352
336 3,745,357
338 3,745,360
365 3,745,358
369 3,745,359

**CLASS 251**

1 3,744,749
28 3,744,750
276 3,744,751
292 3,744,752
307 3,744,753
309 3,744,755
363 3,744,754

**CLASS 252**

1 3,745,116
48.2 3,745,117
49.7 3,745,129
62.1 3,745,118
301.1R 3,745,119
309 3,745,120
3,745,121
3,745,122
3,745,123
3,745,124
312 3,745,125
313S 3,745,126
446 3,745,127
455Z 3,745,128
522 3,745,130
3,745,131

**CLASS 254**

93HP 3,744,756
94 3,744,757
129 3,744,758
150R 3,744,759
187R 3,744,760

**CLASS 256**

24 3,744,761

**CLASS 259**

4 3,744,462
3,744,762
7 3,744,763
44 3,744,764
96 3,744,765
108 3,744,766
117 3,744,767
154 3,744,768
185 3,744,769
192 3,744,770

**CLASS 260**

2A 3,745,132
2.5AM 3,745,134
2.5AW 3,745,133
23EM 3,745,135
23XA 3,745,145
29.6RB 3,745,136
33.4UR 3,745,138
33.6A 3,745,137
38 3,745,139
40R 3,745,140
3,745,141
41R 3,745,142
41.5R 3,745,143
45.75B 3,745,146
45.75R 3,745,144
45.85S 3,745,147
45.95C 3,745,148
65 3,745,149
75T 3,745,150
78L 3,745,151
78P 3,745,152
79 3,745,153
88.2R 3,745,154
93.76 3,745,163
112B 3,745,155
210.5 3,745,156
240D 3,745,160
240G 3,745,159
240.1 3,745,157
243R 3,745,158
250R 3,745,161
283S 3,745,162
293.52 3,745,164
293.77 3,745,165
296D 3,745,166
307D 3,745,167
307F 3,745,168
309.7 3,745,169
326.1 3,745,174
326.3 3,745,175
326.5M 3,745,171
326.5S 3,745,170
328 3,745,172
332.2C 3,745,173
335 3,745,176
346.1M 3,745,177
346.6 3,745,179
348.5L 3,745,178
396N 3,745,180
400 3,745,181
429.7 3,745,183
437S 3,745,184
3,745,185
453R 3,745,186
455A 3,745,187
456R 3,745,188
475P 3,745,182
593R 3,745,189
606 3,745,190
606.5P 3,745,191
615P 3,745,192
621G 3,745,193
680E 3,745,194
681.5 3,745,195
881 3,745,196
940 3,745,197
957 3,745,198

**CLASS 261**

78A 3,744,771
80 3,744,772
88 3,744,773
92 3,744,774
122 3,744,775

**CLASS 264**

3R 3,745,199
37 3,745,200
41 3,745,202
43 3,745,201
48 3,745,203
257 3,745,204

**CLASS 266**

6R 3,744,776
21 3,744,777
3,744,778
33S 3,744,779
34PP 3,744,781
34L 3,744,780

**CLASS 267**

136 3,744,783
154 3,744,782

**CLASS 269**

47 3,744,784

**CLASS 270**

45 3,744,785
52.5 3,744,786
56 3,744,787

**CLASS 271**

1 3,744,788
42 3,744,789
64 3,744,790
80 3,744,791

**CLASS 272**

73 3,744,794

**CLASS 273**

1R 3,744,792
3,744,793
86B 3,744,795
105.2 3,744,796
131AB 3,744,797
135E 3,744,800
159 3,744,798
183R 3,744,799
208 3,744,801

**CLASS 274**

1R 3,744,802
3 3,744,803
4R 3,744,804

**CLASS 277**

96 3,744,805
152 3,744,806

**CLASS 279**

1SJ 3,744,808
1A 3,744,807
121 3,744,809

**CLASS 280**

11.35T 3,744,810
12K 3,744,811
35 3,744,812
124R 3,744,813
150AB 3,744,815
3,744,816
3,744,817
150SB 3,744,814
150B 3,744,818
47" 3,744,819

**CLASS 281**

5 3,744,820
21 3,744,821

**CLASS 285**

18 3,744,822
21 3,744,823
317 3,744,824
407 3,744,825

**CLASS 287**

189.36D 3,744,826
189.36H 3,744,827

**CLASS 292**

22 3,744,829
29 3,744,830
59 3,744,828
81 3,744,831
101 3,744,832
251.5 3,744,833
302 3,744,834

**CLASS 293**

1 3,744,835

**CLASS 294**

67BA 3,744,836
74 3,744,837
116 3,744,838

**CLASS 296**

1R 3,744,839
23MC 3,744,840
27 3,744,841

**CLASS 297**

180 3,744,842
316 3,744,843
355 3,744,844
439 3,744,845
452 3,744,846

**CLASS 299**

2 3,744,847

**CLASS 303**

9 3,744,848
21BE 3,744,849
3,744,851
3,744,855
21B 3,744,850
21F 3,744,853
21P 3,744,852
3,744,854
54 3,744,856

**CLASS 305**

10 3,744,857

**CLASS 307**

3 3,745,361
10R 3,745,362
34 3,745,363
64 3,745,365
68 3,745,366
108 3,745,367
116 3,745,368
131 3,745,369
205 3,745,370
221C 3,745,371
222C 3,745,372
228 3,745,373
230 3,745,374
231 3,745,375
252B 3,745,378
3,745,379
252J 3,745,377
260 3,745,380
265 3,745,381
293 3,745,382
3,745,383

**CLASS 308**

5R 3,744,858
72 3,744,859
109 3,744,860
187 3,744,861
201 3,744,862
214 3,744,863

**CLASS 310**

8.2 3,745,384
13 3,745,386
49 3,745,388
51 3,745,387
52 3,745,389
71 3,745,390
90 3,745,391
168 3,745,392
215 3,745,394
239 3,745,393
260 3,745,395

**CLASS 312**

35 3,744,865
42 3,744,866
234 3,744,867
244 3,744,864
263 3,744,868
330 3,744,869

**CLASS 313**

37 3,745,396
70C 3,745,397
92B 3,745,398
144 3,745,400
272 3,745,401
309 3,745,402
341 3,745,403

**CLASS 315**

11 3,745,404
13CG 3,745,405
25 3,745,406
30 3,745,407
3,745,408
100 3,745,409
209R 3,745,411
248 3,745,410

**CLASS 317**

2R 3,745,412
4 3,745,413
18D 3,745,414
3,745,415
20 3,745,416
31 3,745,417
40A 3,745,418
99 3,745,399
137 3,745,419
146 3,745,420
148.5B 3,745,421
233 3,745,376
234R 3,745,422
3,745,423
235R 3,745,424
3,745,425
3,745,426
3,745,427
3,745,428
3,745,429
256 3,745,430
258 3,745,431
259 3,745,432

**CLASS 318**

115 3,745,433
139 3,745,434
254 3,745,435
464 3,745,436

**CLASS 321**

5 3,745,437
8R 3,745,438
18 3,745,439
26 3,745,440

**CLASS 322**

20 3,745,441
24 3,745,442

**CLASS 323**

.1 3,745,443
17 3,745,444

**CLASS 324**

1 3,745,445
3 3,745,446
28RS 3,745,447
34R 3,745,448
37 3,745,449
41 3,745,450
51 3,745,451
3,745,453
54 3,745,452
64 3,745,454
71CP 3,745,455
73R 3,745,456
83R 3,745,457
85 3,745,458
157 3,745,459
158T 3,745,460
174 3,745,461

**CLASS 325**

22 3,745,462
42 3,745,463
62 3,745,464
119 3,745,466
304 3,745,467
363 3,745,465
455 3,745,468
471 3,745,469

**CLASS 328**

38 3,745,470
41 3,745,364
61 3,745,471
63 3,745,472
133 3,745,473
134 3,745,475
145 3,745,474

**CLASS 330**

4.3 3,745,476
13 3,745,477
30D 3,745,478

**CLASS 331**

56 3,745,479
60 3,745,480
94.5G 3,745,482
94.5 3,745,481
3,745,483
107A 3,745,485

**CLASS 333**

30 3,745,486
31R 3,745,487
33 3,745,488
70S 3,745,489
71 3,745,490
98 3,745,491

**CLASS 335**

167 3,745,492
206 3,745,493
210 3,745,494
229 3,745,495
230 3,745,496
266 3,745,497

**CLASS 336**

65 3,745,498
160 3,745,499
192 3,745,500

**CLASS 337**

122 3,745,501

**CLASS 338**

3 3,745,502
12 3,745,503
15 3,745,504
20 3,745,505
22 3,745,506
25 3,745,507
320 3,745,508

**CLASS 339**

14R 3,745,509
17R 3,745,510
49R 3,745,511
59M 3,745,512
91R 3,745,514
95R 3,745,513
156R 3,745,515
228 3,745,516

**CLASS 340**

1R 3,745,517
3D 3,745,520
3E 3,745,518
3,745,519
18CM 3,745,521
52R 3,745,522
3,745,523
76 3,745,524
146.1AL 3,745,525
3,745,526
3,745,528
146.1E 3,745,529
146.3B 3,745,527
171A 3,745,530
172.5 3,745,531
3,745,532
3,745,533
3,745,534
3,745,535
173CH 3,745,536
173FF 3,745,538
173R 3,745,540
3,745,537
174PW 3,745,539
174TF 3,745,541
174.1E 3,745,542
206 3,745,543
227.1 3,745,544
250 3,745,545
251 3,745,546
253E 3,745,547
258B 3,745,548
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276 3,745,552
3,745,551
324R 3,745,553
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3,745,555
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347DA 3,745,562
347DD 3,745,560
365A 3,745,558
378 3,745,564
381 3,745,563
3,745,565

**CLASS 343**

5SA 3,745,568
5R 3,745,566
3,745,567
6.5SS 3,745,569
7ED 3,745,572
7PF 3,745,573
7A 3,745,574
7.7 3,745,570
3,745,571
12R 3,745,575
13R 3,745,576
16M 3,745,577
17.2R 3,745,578
17.7 3,745,579
100SA 3,745,580
730 3,745,581
742 3,745,583
758 3,745,582
792.5 3,745,584
3,745,585

**CLASS 346**

76 3,745,586

**CLASS 350**

1 3,744,870
3.5 3,744,871
36 3,744,872
63 3,744,873
96B 3,744,874
150 3,744,875
157 3,744,876
160LC 3,744,878
160P 3,744,877
162SF 3,744,879
214 3,744,880
218 3,744,881
241 3,744,882
244 3,744,883
255 3,744,884
307 3,744,885

**CLASS 351**

113 3,744,886
153 3,744,887
178 3,744,888

**CLASS 352**

72 3,744,889

**CLASS 353**

26 3,744,890
27 3,744,891
63 3,744,892
75 3,744,893
101 3,744,894

**CLASS 355**

3 3,744,895
3,744,896
3,744,897
3,744,898
14 3,744,899
16 3,744,900
38 3,744,901
53 3,744,902
117 3,744,903
125 3,744,904

**CLASS 356**

4 3,744,906
70 3,744,907
106RL 3,744,908
106 3,744,909
3,744,910
108 3,744,912
109 3,744,911
141 3,744,913
152 3,744,914
156 3,744,905
160 3,744,915
161 3,744,916
168 3,744,917
188 3,744,918
189 3,744,919
256 3,744,920

**CLASS 401**

2 3,744,921
190 3,744,922
265 3,744,923

**CLASS 408**

156 3,744,924

**CLASS 415**

17 3,744,925
92 3,744,926

**CLASS 416**

2 3,744,927
31 3,744,928
145 3,744,929
174 3,744,930
224 3,744,931

**CLASS 417**

8 3,744,932
50 3,744,933
237 3,744,934
370 3,744,935
536 3,744,936
565 3,744,937

**CLASS 418**

18 3,744,938
30 3,744,939
60 3,744,940
61 3,744,941
76 3,744,942

**CLASS 423**

10 3,745,205
22 3,745,206
154 3,745,207
166 3,745,208
371 3,745,209
462 3,745,210

**CLASS 424**

1 3,745,211
9 3,745,212
19 3,745,213
78 3,745,214

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 251 | 3,745,216 | 342 | 3,745,221 | 62 | 3,744,945 | 259 | 3,744,951 | 126 | 3,744,956 | 58 | 3,744,962 |
| | 3,745,217 | 346 | 3,745,222 | 79 | 3,744,946 | 336 | 3,744,952 | | 3,744,957 | 59 | 3,744,961 |
| 285 | 3,745,218 | 353 | 3,745,223 | 114 | 3,744,947 | | **CLASS 431** | 150 | 3,744,958 | | 3,744,963 |
| 288 | 3,745,219 | | **CLASS 425** | 125 | 3,744,948 | 13 | 3,744,953 | | **CLASS 432** | 120 | 3,744,964 |
| 327 | 3,745,215 | 6 | 3,744,943 | 153 | 3,744,949 | 16 | 3,744,954 | 12 | 3,744,959 | 137 | 3,744,965 |
| 341 | 3,745,220 | 7 | 3,744,944 | 186 | 3,744,950 | 66 | 3,744,955 | 23 | 3,744,960 | 176 | 3,744,966 |

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D 4— | 31 | 227,620 | 173 | 227,638 | D 9— | 39 | 227,654 | D24— | 1 | 227,670 | 227,686 | 227,702 |
| | | 227,621 | 196 | 227,637 | | 102 | 227,655 | D26— | 5 | 227,671 | 14 227,688 | 227,703 |
| | | 227,622 | D 7— | 36 | 227,639 | | 159 | 227,656 | | 227,672 | 15 227,687 | 9 227,704 |
| | 32 | 227,623 | | 45 | 227,640 | | 216 | 227,657 | | 227,673 | 227,689 | D57— 1 227,705 |
| | 38 | 227,624 | | 60 | 227,641 | | | 227,658 | 14 | 227,674 | D40— 1 227,690 | 227,706 |
| D 6— | 7 | 227,625 | | 85 | 227,642 | | 258 | 227,659 | | 227,675 | D45— 4 227,691 | D64— 11 227,707 |
| | 16 | 227,626 | | 107 | 227,643 | | 292 | 227,660 | | 227,676 | D48— 20 227,692 | D71— 1 227,708 |
| | 20 | 227,627 | | 137 | 227,644 | D13— | 1 | 227,662 | | 227,677 | 227,693 | 227,709 |
| | 40 | 227,628 | | | 227,645 | | | 227,663 | | 227,678 | D49— 9 227,695 | D73— 227,710 |
| | 42 | 227,629 | | 153 | 227,646 | | | 227,664 | | 227,679 | 14 227,694 | D74— 21 227,711 |
| | 52 | 227,630 | | | 227,647 | D14— | 3 | 227,661 | 15 | 227,680 | D52— 3 227,696 | D85— 2 227,712 |
| | 58 | 227,631 | | 170 | 227,648 | | 30 | 227,665 | D29— | 2 227,681 | 6 227,697 | 8 227,713 |
| | 62 | 227,632 | | 193 | 227,649 | D16— | 3 | 227,666 | D34— | 227,682 | 10 227,698 | D86— 10 227,714 |
| | 66 | 227,633 | D 8— | 14 | 227,650 | D22— | 27 | 227,667 | | 5 227,683 | 227,699 | 227,715 |
| | 69 | 227,634 | | 17 | 227,651 | | | 227,668 | | 227,684 | 227,700 | 227,716 |
| | 95 | 227,635 | | 68 | 227,652 | D23— | 149 | 227,669 | | 227,685 | D56— 4 227,701 | 227,717 |
| | 154 | 227,636 | | 117 | 227,653 | | | | | | | |

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| 117— | 17 T912,001 | 264— | 51 T912,003 | | | | | |

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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| | | | | | |
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| 3,744,401 | 3,744,837 | 3,745,511 | 3,744,644 | 3,744,213 | 3,744,273 |
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| 3,744,581 | 3,745,318 | 3,745,305 | 3,745,387 | 3,745,352 | 3,745,065 |
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| 3,744,822 | 3,745,452 | 3,744,425 | 3,744,169 | | |

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| | | | | | |
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| 4 : 227,668 | 9 : 227,716 | 227,692 | 27 : 227,625 | 227,653 | 227,684 |
| 6 : 227,631 | 12 : 227,632 | 227,694 | 227,688 | 227,660 | 41 : 227,682 |
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| 227,674 | 227,657 | 24 : 227,636 | 227,669 | 39 : 227,635 | 227,707 |
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| 227,712 | 227,670 | 227,639 | 36 : 227,644 | 227,679 | 51 : 227,651 |
| 227,713 | 227,680 | 227,648 | 227,645 | | |

## Defensive Publications Applications

[Notice of Dec. 16, 1969, 869 O.G. 6877]

| | | | | | |
|---|---|---|---|---|---|
| 10 : T912,007 | T912,005 | T912,006 | T912,008 | 47 : T912,001 | T912,002 |
| 36 : T912,004 | | | | | |

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